RAILWAY AGE

Railway Wages and Competitive Transportation

There have been many disputes between the railways and their employees regarding wages, but the question of wages is complicated now by conditions that never existed before. These conditions are due principally to the unprecedented competition to which the railways are being subjected. There is great need for co-operation by the railways and their employees in dealing with the problems created by waterway and highway competition; and it will be very unfortunate for both of them if there occurs a wage dispute in which inadequate consideration is given to the need for such co-operation.

The nation suffered from depression in 1921 and the first half of 1922, as it has in 1931 and 1932. Consider, however, how much worse railway earnings have become during this depression than during the depression a decade ago. In the first half of 1922 passenger earnings were $503,000,000 and in the first half of 1932 only $201,000,000, a decline of 60 per cent. This decline of passenger earnings was due mainly to highway competition—partly competition from buses, but principally competition from private automobiles. Freight revenues in the first half of 1922 were $1,867,000,000, and in the first half of 1932 only $1,287,000,000. This decline in freight revenues has been due only partly to reductions of freight rates, because the number of ton-miles handled by rail in the first half of 1932 was actually 25 per cent less than in the first half of 1922. Total earnings in the first half of 1932 were only $1,601,000,000 as compared with $2,614,000,000 in the first half of 1922, a decline of almost 40 per cent.

Wages and Rates in 1921-1922 and 1931-1932

Highway competition was almost a negligible factor in 1921 and 1922, but it was deemed necessary by the Railroad Labor Board to reduce wages in both years and by the Interstate Commerce Commission to reduce freight rates in 1922. Highway competition has been largely responsible for the great decline in railway freight business in 1931 and 1932, but in this period there has been only a temporary reduction of 10 per cent in wages, and almost no reductions of freight rates excepting those compelled by water and highway competition. In the first half of 1922 the number of railway employees averaged 1,593,000, and in the first half of 1932 only 1,086,000, a decline of 507,000, and railway net operating income declined from $349,000,000 in the first half of 1922 to $112,000,000 in the first half of 1932.

As the figures indicate, owing to differences in the developments that have occurred and the policies that have been followed, railway men have suffered far worse from unemployment and the railways far worse from losses of earnings in the depression of 1931-1932 than in the depression of 1921-1922. Of course, the present depression has been longer and more severe; but its duration and severity probably have been increased by the postponement of needed reductions of wages and other readjustments that were made more promptly in 1921-1922; and the increasing competition of other means of transportation has contributed greatly during this depression to reducing railroad traffic, earnings and employment.

Freight Rates, Wages and Competition

There is agreement between railway managements, labor leaders and employees that no reasonable effort should be spared to secure state and federal legislation which, by applying comparable regulation to all carriers and withdrawing subsidies from the competitors of the railways, would help the railways to recover traffic, and increase their earnings and their ability to give employment. There is apparently wide disagreement between managements and labor leaders regarding the policies which should be adopted with respect to working conditions and wages. Railway managements believe that wages must be reduced more than the 10 per cent deduction from employees' earnings agreed upon for the year ending February 1, 1933.

Railway labor leaders are advocating the establishment of a six-hour day with the same compensation that was paid for an eight-hour day prior to February 1, 1932.

Railway employees, before deciding whether they will support the Railway Labor Executives' Association in demanding hours and wages the fixing of which would not only prevent a reduction but cause a large increase in railway operating expenses, should carefully study and consider the conditions with which the railways and their employees are confronted. Railway freight rates now average about the same as in 1929, while the average wholesale price of commodities declined 34 per cent between July, 1929, and July, 1932, and the decline in prices of farm products was greater. Commodity prices now average less than before the war in 1913, while railway freight rates are much higher than then. If business begins substantially to revive commodity prices will advance, but there is no experience to warrant the belief that, unless there is another great war, they will become as high again as in 1929. Because of present and prospective price levels the railways are in danger of being confronted with demands for reductions of freight rates, the necessity for maintaining which at the present level is mainly due to the fact that the average hourly railway wage is not quite 10 per cent less now than in 1929 and averages almost 160 per cent more than in 1913. Because of reductions in hours worked as well as wages the average annual earnings of employees in 1932 apparently will be 14 per cent less than in 1929, but this will leave them almost 100 per cent greater than in 1913.

The Menace of Competition

The railways are not only in danger of demands for reductions of freight rates, but actually are meeting upon every hand competition which is able to tear down their rates not only because it is competition that is subsidized and not regulated, but because the employees of competing operators of trucks and boats are working much longer hours and being paid much lower wages than the employees of railways.

These conditions are a serious menace to the earning capacity of the railways, and their ability to increase, or even maintain, employment, and they must be faced. It is true railway freight rates average 47 per cent higher than before the war, but the railways cannot reduce them and afford to continue to pay an average hourly wage that is still 160 per cent higher than before the war. Nor can they afford to continue to maintain present freight rates and present wages if the result is going to be a continuing loss of traffic to trucks and other competitors. As to the increase in operating expenses that would be caused by the establishment of a six-hour day at eight hours pay, there would be no way they could get the earnings to stand it, and it would compel them to abandon a large part of their present property and service, and to largely reduce, not increase, employment.

Future of Railways and Employees Involved

Those, including railway employees, who squarely face and sanely appraise these conditions and facts can reach only one conclusion. The present railway wage question is not a question as to whether railway employees shall, as has been asserted, "pay a dole to idle capital". *It is a question as to whether railway capital, property and employment shall be permanently destroyed.* The number of men the railways can employ and the average wage they can pay depends upon the total payroll they can meet. The total payroll they can meet depends upon the total amount of earnings they can make. The total earnings they can make depend upon the amount of traffic they can secure and the passenger and freight rates they can get. Therefore, the more their rates or traffic are reduced the smaller will be either the average wage they can pay or the number of men they can employ.

Appeals to prejudice by describing the reduction of wages as a "dole to idle capital" will not alter the actual conditions or facts in the least. The reduction of more than 500,000 in the number of railway employees since 1929, and the reduction of 10 per cent in pay now in effect, have been forced by the reduction that has occurred in railway traffic and earnings; and anything that drives away traffic will inevitably restrict or reduce railway employment in future. The union coal miners stood fast for maintenance of their wages after wages had been reduced in the non-union mines. The result was a great decline of production and increase of unemployment in the union mines, and a great increase of production and employment in the non-union mines. There will continue to be similar diversions of traffic and employment from the railroads to the waterways and highways if railway employees prevent readjustments of working conditions and wages necessary to enable the railways to meet competition.

What Will Employees Do?

What, then, are railway employees going to do? Will they co-operate with railway managements to establish such competitive conditions, not only as respects government treatment of different classes of carriers, but, also, as respects wages and working conditions, as will enable the railways to get enough traffic to employ more men at the highest wages competitive and other conditions will permit, or will they insist upon having wages and working conditions which will make railway operation so expensive that more and more traffic will be driven to the highways and waterways, and that the number of railway employees will tend constantly to decline? If the present and former employees of the railways desire to be employed by them, as they unquestionably do, then

they should, in their own interest, co-operate with railway managements in establishing all the conditions necessary to enable the railways to employ them. They are working all over the country to increase railway employment by promoting adoption of government policies that will give the railways a fairer opportunity to compete with other carriers. They will be working to reduce railway employment if they stand fast for conditions of work and wages that would make the cost of operation so high that the railways could not make rates low enough to meet competition without bankrupting themselves.

The future of the railways will be determined largely by their employees; and employees, it seems reasonable to hope, will not disregard the vitally important fact that in contributing toward determining the future of the railways they will also be determining their own future.

Perhaps the Advertising Departments Could Help

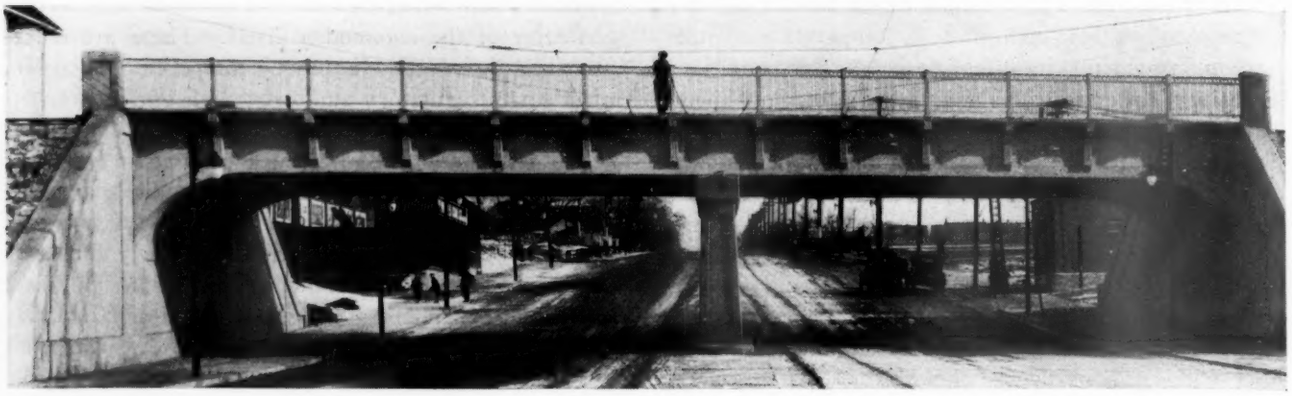
There are, in the business of merchandising household products, organizations the function of which is to find out the probable effects of changes in packaging, in price, in quality, in methods of distribution and in advertising practices. Their services are sought by manufacturers to place their sales plans on a scientific basis, avoiding all possible risks. Thus any large element of chance is eliminated before important changes are made. Staffs of trained investigators are sent to representative communities where they make personal calls on consumers and record detailed statistics. Later these are tabulated and important decisions are thus based on facts rather than *a priori* assumptions or the costly trial and error method.

It is a procedure which the railroads might with profit follow in dealing with the passenger traffic problem. This suggestion does not imply that such a method is unknown on the railroads. On the contrary, we have been privileged to see the working out of a railway advertising campaign on as scientific a plan as we believe any industry could show. But the plan stopped with the advertising. Spread his advertising appropriation ever so effectively in the localities proved by test to be the most likely to yield patronage and in those publications proved to reach the largest number of prospective passengers at the lowest cost per individual, time his advertisements ever so wisely and with the most effective type of "copy"—control all these phases of his sales campaign in the most scientific manner known to modern merchandising: All this the advertising manager did. Yet two essential considerations of a successful sales campaign were beyond his control or even his advice, namely, pricing and the character of the commodity itself. These are determined on the railroad largely by competition, by agreement or by regulatory authority, with but little scientific study of the prospective buyer and his habits, his desires and methods of influencing his action. It is a cardinal principle of successful merchandising that the commodity offered must meet the public need and that it must be correctly priced. Then and only then can advertising do the effective sales job that it should.

Has not the time come when rule of thumb methods in the sale of railroad service must be discarded and a scientific effort made to determine how sales may be increased, having recourse to the same methods of approach to the problem which are successful in determining the best-paying quality, price and packaging of soap, soup, tooth paste, and automobiles? It is not as if the railways had to revolutionize their organizations to put such methods into effect. All that is needed is to apply to service and rates the same methods now followed in the better of their advertising departments, combined with the scientific approach and freedom from *a priori* conclusions which already characterize railroad dealing with operating and technical problems.

A good place to begin the application of this method would be in the determination of what basic rate, or perhaps what scale of several classes of fares, would start the traffic trend upward again and thus, over a term of years, yield the highest revenue. We have long had the suspicion that 3.6 cents per mile is not such a rate and we should like to see it put to the test in the same scientific manner in which a mechanical device would be gaged, or in which a prominent soap manufacturer is even now assessing the relative merits of various proposed changes in the price, packaging and quality of one of his products. Railway advertising departments should be called upon for something more than the most effective purchase of publication "space" and the preparation of "copy". In these departments, we suspect, there lie largely unused potentialities which extend beyond their present duties and the enlistment of which would aid to an important degree in solving the most pressing of all railroad problems, namely, how to increase gross revenues.

AN INCREASE IN CAPITAL OUTLAY OF $1,309,500, or approximately 27 per cent, during the first seven months of 1932 over the same period of 1931 for the establishment of new industries and the expansion of existing plants in the territory served by the Norfolk & Western, is shown in a comparative survey prepared by T. Gilbert Wood, industrial and agricultural agent. Investment during the first seven months of 1932 for new industries and expansion along the railway lines in Virginia, Ohio, North Carolina, West Virginia and Maryland, amounted to $6,217,500, as compared with $4,908,000 for the same period of 1931. The statement lists 74 new plants and additions for this year, an increase of three over last year. Ohio shows the largest gain in the number of plants and capital outlay, increasing from eight plants and $585,000 in 1931, to 19 plants and $3,657,000 in 1932.



The Attractive Fixed-Frame Bridge Over St. Clair Avenue, Toronto

Unusual Concrete Bridges are Built on the Canadian National

Marked departures from conventional design result in long and shallow spans—Fixed-frame construction and elimination of track ballast are features

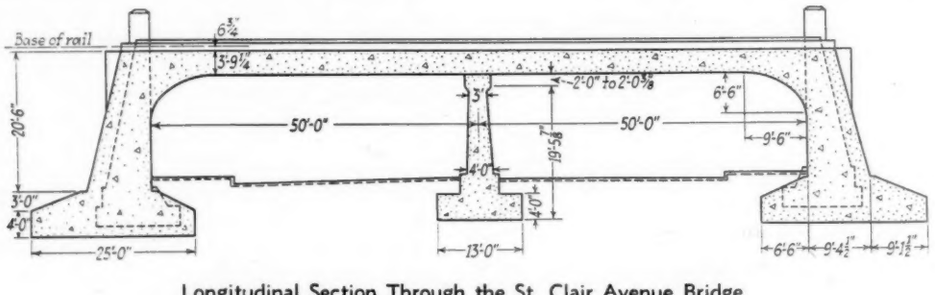
WITH many grade crossing elimination projects confronting it, the Central region of the Canadian National has given much study and thought to reinforced concrete railroad bridge design, with the idea of introducing into this type of construction certain structural economies which would adapt it to a wider range of conditions. As a result, a number of unusual reinforced concrete railroad bridges have been constructed on the Central region during the last three years, which incorporate features considered somewhat impractical only a few years ago, and which, in certain cases, will not yet be fully accepted without extended service tests.

Outstanding among the features involved in several of the bridges are unusually long spans with relatively shallow slabs; the adaptation of the rigid frame type of construction to one of the bridges; and radical departures from the usual type of ballasted deck structure, including the use of reinforced concrete ties directly on the deck slab, without ballast, and in one case, the anchoring of the rails directly to the deck slab, with no cushion other than hardwood filler strips. These latter features of track design were incorporated primarily to minimize the distance from base of rail to the underside of the deck slab. That success has attended the efforts in this direction is seen in the fact that in the case of one bridge, which has a clear span of 49 ft. each side of a center pier, the depth of the deck structure, from base of rail to underclearance, is only 4 ft. 3¼ in. Other interesting features of the bridges are the unusually high strength concretes secured in their construction, and the pleasing finish given to all exposed surfaces, making the structures unusually attractive.

Fixed-Frame Construction Offers Advantages

Of the dozen or more interesting new bridges on the Central region, which range from relatively simple appearing structures carrying a single track to quite extensive structures on severe skews and carrying as many as 13 tracks, one of the most interesting is the double-track structure carrying the main lines of the Newmarket subdivision over St. Clair avenue in Toronto. This bridge, which is of reinforced concrete construction throughout, is of the fixed or rigid-frame type, with a track structure of reinforced concrete ties resting directly upon the deck slab.

While the rigid frame is used quite generally in



Longitudinal Section Through the St. Clair Avenue Bridge, Showing Arrangement and Principal Dimensions

highway bridge construction in certain sections of the country, its application in bridges for railroad loadings is rather uncommon. In this type of construction, as will be noted in one of the illustrations, the abutments and deck slab are cast monolithic. The ends of the slab are designed to take negative moment which is carried into the abutment by the rigid connection of the former to the latter. The resultant decrease in the positive moment at the center of the span permits of an appreciable reduction in the effective depth of the slab compared with a simple-span slab. Excessive stresses at the re-entrant angle where the slab joins the abutment are avoided by the introduction of a fillet which is given a curved outline that adds greatly to the general appearance of the structure.

The bridge over St. Clair avenue, which is on an angle of about 32 deg. with the center line of the street, is 100 ft. long from face to face of abutments, and is divided into two clear spans of 49 ft. by a pier in the middle of the street. These spans are made up of a slab 27 ft. 6 in. wide that is continuous over the pier and monolithic with the abutments, but without a fixed connection between the slab and the pier. The slab therefore acts as a continuous beam over two spans with fixed or partially fixed ends. The curved fillets at the junction with the abutments do not encroach on the clearance requirements over the sidewalks in the street below. Through this means it was possible to develop a thoroughly practical design of slab having a total depth of only 3 ft. 9¼ in.

A further item of interest in connection with the deck slab is the walkways that were cast integral with the slab on both sides. These walkways, one of which extends 2½ ft. and the other 7½ ft. from the slab, consist of thin slabs supported on series of cantilever brackets which are spaced on 8-ft. centers and have a maximum thickness of 11 in. The outer edges of both walkways are provided with ornamental iron railings which extend between concrete posts located directly above and in line with the walk-supporting brackets.

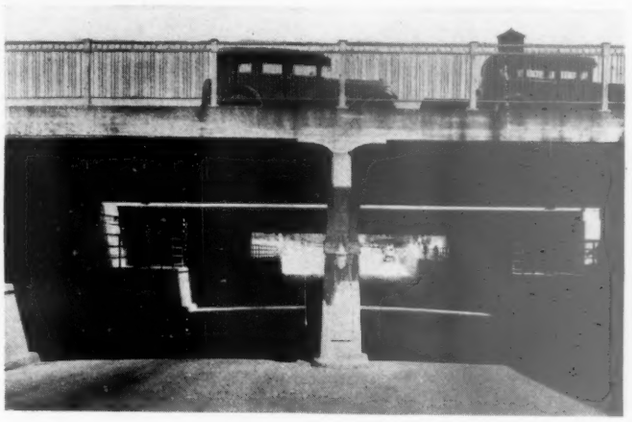
The bridge abutments do not differ essentially from the usual type of reinforced concrete abutments except for the modified shape involved in making them integral with the deck slab and for that part of the reinforcing

View Showing Deck and Track Construction on the St. Clair Avenue Bridge

which is common with that of the slab. The abutments are of mass design with spread footings 31 ft. 6 in. long and 25 ft. 7⅝ in. in width, that were necessary because of the character of the supporting soil and the heavy loads imposed by the long spans.

Concrete Ties—No Ballast

The type of track structure provided on the bridge is equally as interesting as the bridge proper. This consists essentially of reinforced concrete ties resting directly upon the deck slab. The ties, which are of a type designed on the Canadian National, are manufactured from 3,000-lb. concrete and are 10 ft. 6 in. long. To afford suitable superelevation in the tracks over the bridge, which are on a 2-deg. 30-min. curve, the ties are tapered, ranging from 12 in. by 7⅞ in. in section at one end to 12 in. by 6¼ in. at the other end. Reinforcing in the ties consists of five ¾-in. square



Looking Through the Richmond Street Subway, Under 15 Tracks and a Roadway, in London, Ont.

bars, placed longitudinally, and a series of seven ¼-in. stirrups. In no case do the bars come closer than 1⅜ in. to the faces of the ties.

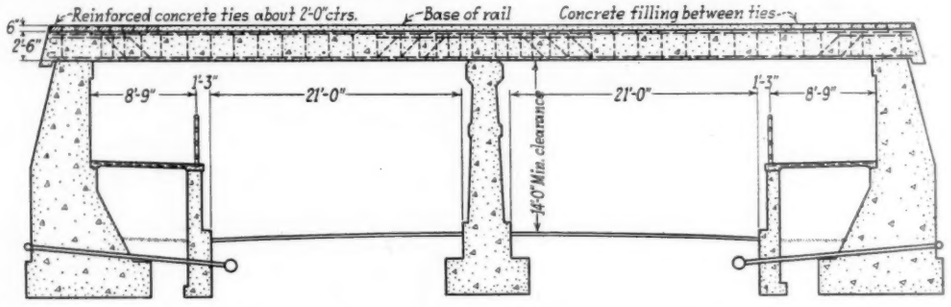
The track rails rest on hardwood cushion strips, which, in turn, are seated in grooves 5¾ in. wide and ⅞ in. deep, provided in the upper faces of the ties. The rail cushion strips are essentially planks equal in width to the base of the rail, but tapered in section from a thickness of about 1⅛ in. on one side to ⅞ in. on the other, to provide the desired cant in the rails.

The rails are secured to the ties by means of clips, held in place by ¾-in. square-head bolts, 4 in. long, which pass through the clips and into internally-threaded pipe sleeves embedded in the concrete of the ties. Four holding sleeves are provided at each rail seat, the individual sleeves being 4¾ in. long and anchored in the concrete by means of a steel pin passed horizontally through them below the lowest possible travel of the rail-fastening bolt. Spring washers are used on top of the rigid rail clips and, whereas only two holding bolts are used at each end of the tie, the spare sleeves are sealed with cast iron plugs to exclude water or moisture. Each tie contains approximately 100.8 lb. of reinforcing steel and 0.229 cu. yd. of concrete, and weighs approximately 1,030 lb.

In constructing the track structure, the ties were lined up on the deck for both tracks, about two feet center to center, and the rails were then bolted in place. After the tracks had been lined carefully, the surface taking care of itself automatically, the entire area of the deck between the ties of both tracks was poured with concrete, flush with the tops of the ties, to anchor them in place permanently.

Natural drainage of the bridge deck and track structure is afforded through the fact that the deck slopes toward one end on a 0.5 per cent grade, discharging the water over the back face of the lower abutment where a suitable drainage system is provided to carry it off. In view of the favorable deck drainage and the density of the concrete provided in construction, the bridge deck was not waterproofed with any form of coating.

In many respects, the fixed frame type of bridge for grade separation project is considered an ideal structure by those who designed and built the bridge over St. Clair avenue. They point out its unusually pleasing appearance; the appreciable saving in headroom through the thin slab possible; and the fact that it is economical to construct. They point out also that it can be constructed rapidly, and in evidence of this fact that the entire superstructure of the St. Clair avenue bridge, from the bottoms of the foundations of both abutments, was concreted in 72 hours, and that had early high-strength concrete been used, the bridge could have been put in service within two weeks of the placing of the concrete. Furthermore, they call attention to the minimum of maintenance which such a structure will require, both the superstructure and the track structure without the usual ballast and timber ties, and also to the fact that this type of bridge, if for more than one track, can be built under traffic by constructing only sufficient width at a time to carry one track, and then moving traffic to the finished portions as completed. This factor was not taken advantage of in the case of the St. Clair Avenue bridge since it was found more advantages to keep traffic at the street level during construction and to complete the full width of the bridge without any interference to traffic by the work, or to the work by traffic.



Longitudinal Section Through Richmond Street Bridge Showing General Details of Construction Employed

Same Track Construction Used on Other Bridges

The same type of rigid track structure used on the St. Clair Avenue bridge was also used on several other reinforced concrete railroad bridges built on the Canadian National in connection with grade separation projects, including a 13-track structure over Richmond street, London, Ont., with a slab deck continuous over two spans, and bridges over La Canardiere road, Limoilou, Que., and Simcoe street, Oshawa, Ont., both of which have decks constructed of precast concrete slabs.

The bridge forming the Richmond Street subway, which includes a 13-track section and a separate 2-track section, in addition to a 24-ft. vehicle roadway, consists essentially of mass type abutments, a center pier, a steel and concrete roadway deck, and track slabs of reinforced concrete, cast in place, continuous over the center pier. The length of the bridge between abutment faces is 66 ft., which provides clear spans of 31½ ft. on both sides of the center pier. The full length of the undercrossing, including the roadway deck, is approximately 268 ft.

Sidewalks, nine feet wide, were provided along the sides of the lowered street, but for several reasons these were constructed at a level about five feet above the street pavement and were separated from the roadway by means of curb walls and pipe railings. Through this expedient, in combination with short 10 per cent ramps leading to the lowered walks, grading for the walkways was materially reduced, and, directly beneath the bridge structure, the effective width for the roadway and walks was materially increased. In this latter regard, the placing of the walks at the higher level, opposite the vertical faces of the abutments, enabled the bases of the abutments to be spread forward under the walks, instead of toward the rear, thus saving in the amount of excavation required, without at the same time reducing the effective width of underpass.

The railroad deck slab, which was poured in sections with expansion joints at intervals of from about 30 to 40 ft., is unusual in that at both ends it extends over and several inches beyond the full top width of the abutments, excluding all possibility of deck drainage water accumulating on the slab seats or reaching the face of the abutment. The deck drainage carried over the backs of the abutments is taken care of adequately through dry packing and subdrainage pipes which have connection with city sewers.

The thickness of the deck slab, which is reinforced for compression as well as tension, is only 2 ft. 6 in., and, in combination with the use of reinforced concrete ties laid directly on top of the slab, as in the case of the St. Clair Avenue bridge, the total thickness of the deck structure from base of rail to the under side of the deck slab is only 3 ft. The practical advantage of the relatively thin deck structure in the case of this bridge is seen in the fact that the street was lowered as far as was possible without interfering with a large brick sewer longitudinally beneath it, and, therefore, required that all headroom above the lowest practical pavement level be provided through raising the tracks. While such alterations of tracks are usually undesirable and expensive, they would have been particularly so in connection with the Richmond Street crossing because 13 tracks were involved and the normal track gradients were not conducive to elevation.

Concrete Ties Used on Precast Deck Slabs

In the cases of the bridges over La Canardiere road at Limoilou, and over Simcoe street at Oshawa, where the same type of track construction was used as at Richmond street, London, and St. Clair avenue, Toronto, the main difference in design is in the deck slab. In these cases, where it was necessary to construct the bridges under traffic, precast slab units were used. These bridges are more or less similar in design and size, having center piers, with an opening of 61 ft. between abutment faces at La Canardiere road, and of 60 ft. at Simcoe street.

In both bridges the decks are of reinforced concrete units from 4 ft. 7 in. to 5 ft. 3 in. wide by 3 ft. 4 in. deep, and from about 30 ft. 6 in. to 37 ft. 6 in. long.

and are designed to interlock longitudinally with each other. The lifting weight of the slab units ranged from 51 to 57 tons. All joints between the units were filled with asphalt mastic, making them watertight and insuring that all deck drainage will be carried to the rear of the abutment walls.

With the full depth of the deck slabs only 3 ft. 4 in. in the case of these bridges and with 6-in. reinforced concrete ties directly on top of the slabs, the total depth of the deck structure, from base of rail to bottom of the slabs was held down to 3 ft. 10 in. Furthermore, by using precast units in these bridges, set in place by derricks, it was possible to construct the bridges progressively, always maintaining a part of them in service.

Other bridges of this type have been built on the Canadian National, including a two-track structure 69 ft. 7 in. long near Paris, Ont., and a 12-track structure at Toronto. The latter bridge, which is made up of 42 slabs, each weighing 85 tons, was built under traffic and the entire deck was set in place by derricks in 16 working days, without interruption to train service. Both bridges have track structures similar to those on the bridges at La Canardiere road and Simcoe street.

Bridge Has Neither Ties Nor Ballast

While a number of other interesting grade crossing elimination bridges have been constructed on the Canadian National in recent years, one at Breslau, Ont., while only a single-track structure, is of special interest because of its design and the manner in which it was erected. This bridge, which is approximately 118 ft. long and on a skew of 25 deg. 30 min. with the center line of the street, is a half-through plate girder structure with a steel and concrete deck, supported on two abutments and a center pier.

The superstructure, which is divided into two spans by the pier, consists essentially of two lines of steel girders, 7 ft. ½ in. deep, back to back of flange angles, and spaced 17 ft. 6 in. center to center, but instead of any one of the usual types of steel floor systems, the deck consists of 30-in. steel floorbeams, 7 ft. center to center, which are encased in concrete integral with a 12-in. reinforced concrete floor slab. Instead of stringers, there is a reinforced concrete T-beam with a stem about 20 in. square in section under each line of track rails. The over-all depth of the floor system is 2 ft. 10 in., and the distance from the top of the deck to the lowest point of the girders is 3 ft. 4¼ in.

These same dimensions hold true when referring to the track and deck structure as a whole, because neither ties nor ballast are used on this bridge, the rails being supported directly on hardwood cushion strips laid in longitudinal grooves provided in the top faces of the floor slabs. The method of seating the rails and of holding them in place is practically identical with that employed in connection with the use of concrete ties on the bridges already mentioned, including the use of rail clips and ¾-in. bolts which are turned down into internally-threaded pipe sleeves embedded in the concrete. In other words, the base of rail is practically on a level with the top of the concrete deck, saving the six inches in depth of the concrete ties, in addition to reducing the dead weight of the floor system through the elimination of the ties and the concrete filler poured between them, neither of which adds structural strength to the deck system, unless it be in distributing the live loading.

The two units of the Breslau bridge, one for each side of the center pier, were constructed as a whole on falsework immediately alongside their final positions, without any interference with rail traffic. After their completion they were moved laterally into place on the new abutments and pier on a system of rollers within a period of about four hours between trains.

The Bridge Over La Canardiere Road, Which Has Precast Deck Slabs From 30½ Ft. to 37½ Ft. Long

High Grade Concrete Secured

All of the bridges described were designed for Cooper's E-60 loading using the impact formula $\frac{L^2}{L+D}$. The live loading on each track was assumed to be confined to a width of 13 ft., but actual deflectometer tests after the completion of the bridges showed the load distribution to be much greater.

All deck slabs were reinforced for both tension and compression, and, in general, the same concrete specifications obtained for the different bridges. These specifications called for the use of 2,000-lb. or 2,500-lb. concrete in piers and abutments below the seats, and for 3,000-lb. concrete in all deck slabs, seats and other parts subject to intensive loading of flexure stresses. They also provided for the close control of the water in the mix, the use of Celite as an admixture to increase the workability of the concrete, and the addition of calcium chloride in the mixing water where quick setting was desired.

Owing to the care exercised in the preparation of the concrete, actual tests made during construction showed the concrete to run from 6 to 33 per cent stronger at 28 days than called for. The reinforcing steel also tested well above the specified requirements of a minimum ultimate strength of 80,000 lb. per sq.

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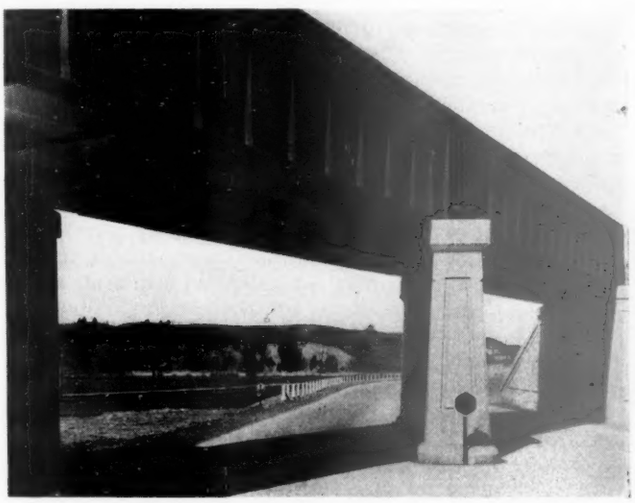


The Underpass at Breslau, Ont., Has an Unusual Floor System

Railways Urged to Anticipate Expenditures

Loans available from R.F.C. for maintenance or new equipment

THE principal details of the plan by which the Reconstruction Finance Corporation is prepared to make loans to railways to enable them to anticipate expenditures for maintenance of equipment or for the purchase of new equipment, in an effort to stimulate employment and business, were explained by Daniel Willard, president of the Baltimore & Ohio, and George H. Houston, president of the Baldwin Locomotive Works, in statements before the National Conference of Business and Industrial Committees held at Washington on August 26 and 27 at the call of President Hoover. A report of the conference was published in last week's issue. The text of the addresses follows:

Mr. Willard's Statement

"A few weeks ago the President, through the Secretary of Commerce, invited several railroad presidents to attend a conference in Washington for the purpose of considering what if anything might be done concerning the unemployment situation. This conference was held at the office of the Secretary of the Treasury on July 28; the following, among others, were present:

Hon. Ogden L. Mills, Secretary of the Treasury,
Hon. Atlee Pomerene, chairman, Reconstruction Finance Corporation,
Hon. C. A. Miller, president, Reconstruction Finance Corporation.
W. W. Atterbury, president, Pennsylvania Railroad,
Hale Holden, chairman, Southern Pacific Lines,
Ralph Budd, president, Chicago, Burlington & Quincy.
W. R. Cole, president, Louisville & Nashville,
R. H. Aishton, chairman, Association of Railway Executives,
George H. Houston, president, Baldwin Locomotive Works and chairman of the Business & Industrial Committee of Philadelphia, and myself.

"Secretary Mills, who presided, explained why the conference had been called. He said that Congress had appropriated a large sum of money to be used in such ways as might contribute most towards relieving the unemployment situation primarily, and also to that end for the purpose of stimulating industry. He said that the President, upon whom rested the responsibility of carrying out the program approved by Congress, felt that the railroads, being large employers of labor, might in themselves constitute a helpful agency to be used in this connection. He added that it was generally thought that because of the depression which had been in effect for more than two years, there was probably a considerable amount of what might be called accumulated undermaintenance on many of the roads, and while no doubt they all had facilities ample for the present volume of business, it had occurred to him that it might be possible and desirable at this time to anticipate expenditures in that connection which might not be presently necessary but which would be necessary when business revived. He said that generally that was the subject which the conference had been called to consider.

"After the matter was fully discussed it was decided that at a subsequent meeting an effort should be made to work out some sort of a formula or plan whereunder the Reconstruction Finance Corporation would consider loaning money to such of the roads as might wish to borrow for the particular purpose mentioned.

"Subsequent conferences were held at the office of the Reconstruction Finance Corporation on August 2 and 3, and were attended by the following railroad representatives:

A. J. County, vice-president, Pennsylvania R. R. Co.,
Geo. H. Pabst, Jr., treasurer, Pennsylvania R. R. Co.,
C. I. Sturgis, vice-president, Chicago, Burlington & Quincy,
Geo. M. Shriver, senior vice-president, Baltimore & Ohio, and myself.

"The subject discussed at the former conference was considered at length and in much greater detail. It was pointed out by representatives of the railroads that no doubt some of the carriers would be willing to give consideration to the borrowing of money with which to anticipate repairs not presently needed, provided the terms granted were such as to justify an expenditure of money for that purpose at this time and under existing conditions. After a full discussion of the matter a statement was prepared by the Reconstruction Finance Corporation setting forth the terms and conditions under which that body would consider loans for the purpose of taking care of deferred maintenance of equipment in particular. In general terms it was proposed that the money would be loaned without collateral in the ordinary sense, but that the cars and engines to be repaired would be held out of service until the money borrowed for such repairs was repaid. It was also understood that the interest on money so used would accrue until the final date of payment but would not be due or collected until the cars and engines were put in service. The rate of interest later on was fixed at 5 per cent.

"The needs of the railroads for new equipment was also discussed and Mr. Houston outlined a plan which he had been developing to cover that particular point. Later on he submitted for the consideration of the railroads a program providing a means of financing new equipment which it was thought would meet the requirements of the present situation.

"At the close of the conference I agreed to arrange for a meeting of the railroad executives at which time I would report for their consideration what had taken place at the several conferences and submit a copy of the formula prepared by the Reconstruction Finance Corporation. A meeting of the railroad executives was held in New York on August 10, at which time the whole matter was reported and discussed at much length.

"I also laid the matter before the Baltimore & Ohio board of directors with the recommendation that I be authorized to arrange for a loan of $3,000,000 on the terms outlined by the Reconstruction Finance Corporation, the money so borrowed to be used for heavy repairs to 150 locomotives and 2,500 freight cars, and for

completing the construction of 1,000 new freight cars which had been started some time ago but work on which had been stopped before the job was finished. This the board authorized me to do.

"The subject, as will readily be understood, is one which could not be acted upon by the roads collectively, but will have to be dealt with by each individual company having in mind its own necessities and circumstances.

"This, in general terms, describes what took place at the first conference in the office of Secretary Mills on July 28, and at subsequent conferences including the meeting of the railroad executives in New York on August 10.

"I think it is not inappropriate that I should refer briefly to another phase of the subject having to do with the unemployment situation which was referred to so feelingly by Mr. Owen D. Young in his address this morning. It has been held by some that expenditures by the railroads at this time of the character proposed would be uneconomic and unsound. It may be that such a course as has been suggested is uneconomic and unsound, although it is by no means certain that such would prove to be the case.

"If, as is hoped by all and believed by many, an upturn in business is imminent, it might develop that expenditures of the kind mentioned would prove to be economic and sound, but granting for the sake of argument that such expenditures at this time would be uneconomic, there is one other phase of the problem which in my opinion ought not to be overlooked and that is the human element in the situation as reflected in the ten or more million men out of work at this time. No country or system of government can expect to endure permanently with such a large number of men out of work and consequently unable to procure the things necessary for life and comfort.

"The unemployment problem which we have in this country today presents a serious threat to the permanency of our institutions, and I submit that a problem which threatens the very foundation of our institutions is not less important than the question of economics which may be involved in the expenditures proposed.

"I believe the managers of the American railroads will give this matter their earnest and sympathetic consideration. In fact at the meeting which was held in New York on August 10, they so expressed themselves. Naturally, it will require some little time to develop just what can be done in each individual case. Of the $3,000,000 which the Baltimore & Ohio Co. contemplates using in this connection, probably not less than $2,000,000 will be paid directly to labor and it will mean the employment of roundly 2,000 men for at least six months; $1,000,000 will probably be required for necessary material to be purchased, and will mean the employment of other men needed in that connection. I think it is not improbable that after the matter has been fully considered by the railway managers, it may develop that as many as 30,000 or 40,000 men, perhaps more, will be given work directly during the winter months, and possibly half as many more indirectly by means of the assistance proposed to be extended by the Reconstruction Finance Corporation. While the number of men so employed is relatively small, nevertheless it would be a substantial contribution toward the settlement of a very serious problem."

Mr. Houston's Statement

The address made by George H. Houston follows:

"Mr. Willard has presented to you very effectively the proposition of stimulating employment during the coming winter by making repairs on our railroads somewhat in advance of the actual necessities. It is a fact, I think, borne out by the history of this country in the past 100 years, that the railroads have participated in leading the country out of every great depression by buying of equipment and materials in advance of actual needs. It is also a fact that the railroads are facing difficulties and complications at the present time probably more severe than at any time in their long history. We believe, however, that the opportunity is at hand for the railroads to render to the country a great public service by again participating as far as their ability and judgment will permit in leading this country out of this depression by buying not only their immediate necessities of materials for repairs and maintenance, but by buying in reasonable anticipation of their future requirements for equipment.

"Probably the greatest difficulty in the consideration of such a program has to do with the financing of the purchase of such equipment. Rolling stock is bought and paid for by a type of security unique and created solely for the purpose, called equipment trust certificate, constituting an obligation of the railroad with a lien upon the equipment. Ordinarily these securities are issued to the amount of seventy-five or eighty per cent of the original purchase price, running for ten to fifteen years, maturing serially and bearing a comparatively low rate of interest and enjoying a prestige in the security market second only to government securities. These securities must be very carefully created and exactly constituted so as to come within the provisions of the New York banking law to make them legal investments for savings banks and trust companies, and when they come within those provisions they are all of an accepted standard.

"The difficulty in discussing with railroads the purchase of forward needs of equipment has been to give them credit machinery which at the present time would permit them to buy this equipment in such manner as to permit financing it in the security markets of the country when railroad securities return to normal standing—to finance it in the interim by the use of this great reservoir of public credit, the Reconstruction Finance Corporation. We have devised such a piece of machinery, and the Reconstruction Finance Corporation has said that it is prepared to entertain applications from any Class I railroad of the country for loans for the financing of equipment in accordance with this plan.

"This plan permits of 80 per cent of the purchase price being borrowed from the Reconstruction Finance Corporation upon trust certificates constituted in strict accordance with the banking laws of the state of New York and thereby standard. It provides further that the equipment company shall take in part payment for the equipment, junior equipment trust certificates which they in turn will deposit with a financing company which will pledge these junior equipment certificates as additional collateral to secure repayment by the railroads of their loans from the Reconstruction Finance Corporation. It is estimated that during the life of the loan from the Reconstruction Finance Corporation set at three years with a possible extension of two, that the railroads will recover together with the economic condition of the country to a point where they will again be able to sell these securities in the open market, pay the Reconstruction Finance Corporation the loans it makes at this time and again be standing entirely on their own.

"This credit machinery is available. The equipment companies engaged in serving the railroads have agreed unanimously and formally to give their support in the manner indicated; a very real support because they

pledge their junior positions with the strong roads to sustain the credit of the weaker roads in these transactions. The country, as Mr. Willard has just pointed out, and as Mr. Young called to our attention earlier, is confronted with a social as well as an economic problem. In my own home city of Philadelphia we have over three hundred thousand men entirely without work. We have one quarter of a million partly employed. Other cities in the country are in equally difficult situations. We realize the severe and difficult positions in which all railroads find themselves. On the other hand, we are confident that the railroads and their managements and directors will see their way clear to using this device for anticipating their future needs of new equipment, of which they have bought practically nothing for some two years. When car loadings start up and get a little more nearly normal and they can see their fixed charges coming in more regularly and have a little leeway, a little breathing space to turn around, we are confident that they will again begin to purchase equipment."

Pennsylvania Railroad Applies for "Work Loan"

The first formal application for a "work loan" was filed with the Interstate Commerce Commission and the Reconstruction Finance Corporation by the Pennsylvania on September 1 asking for $2,000,000 for a three-year term for the construction of 1,500 all-steel box cars "for the sole purpose of furnishing employment to men who would not be otherwise employed this Fall and Winter." The cars will be of 100,000 pounds capacity and the application said their construction in the company's own shops would give employment to about 700 men for five months, working 40 hours per week, adding that this estimate can probably be doubled for orders and work to be given other industries to furnish for the cars approximately 19,000 tons of steel, and the miscellaneous specialties to fully equip the cars, which will employ labor in outside shops and factories.

As security for the loan the company offered its note and the collateral now pledged with the R. F. C. as security for the loan of $27,500,000 previously approved for the purpose of continuing the electrification work.

Waterways of Doubtful Benefit to Wheat Growers

THE Food Research Institute of Stanford University has published a study * which it has made of the probable effect on United States wheat growers of projected and recently completed waterways. Its conclusions go directly counter to those of waterway enthusiasts. Savings in direct transportation charges, even with the taxpayers bearing the burden of the cost of construction and maintenance of the waterways, in the view of the Institute, will be small and these would not be held by the wheat growers but would be divided between them and European consumers.

Nor is the lack of great benefit the only result the Institute foresees. On the contrary, the St. Lawrence project may actually depress American farm prices. "There is a fair possibility," the report says, "that with expansion of acreage in Canada, farm prices of wheat in the United States might tend to be lowered by the opening of the St. Lawrence seaway." The heavy reliance of waterway protagonists upon the support of wheat growers is noted: "In each country [i.e., Canada and the United States] the advocates of a national waterway have utilized this circumstance of the wheat export trade in support of their propaganda." Such support, however, in the opinion of the Institute is misplaced, for "in our view, export waterways hold little promise for American wheat growers." The conclusions of the report are summarized as follows:

"Three waterway improvements designed to serve North American wheat export trade are in operation, in progress, or in contemplation. The Hudson Bay route via Churchill was opened for the first shipments in the fall of 1931. Improvements of the Mississippi and its principal tributaries are in progress, designed to extend the region served by barge shipments to the Gulf. The project for the St. Lawrence seaway has reached the stage of formal treaty between the United States and Canada. Advocates of these improvements, to be made toll-free at public expense, have long held out hopes of substantial gain to wheat farmers of the United States and Canada.

"We hold optimistic forecasts of the early or deferred results to wheat growers to be unwarranted. The Hudson Bay route seems likely to have significance mainly for Saskatchewan. The Mississippi route will mainly divert export shipments of Kansas and Nebraska wheat from present rail or rail-and-lake routes. Two active export areas—Texas-Oklahoma and the Pacific Northwest—are not involved. The St. Lawrence seaway would probably not reduce costs of shipments to Europe by over 5 cents a bushel during the season of open navigation, and the weighted annual saving on export wheats would be less. Whatever savings are made would be divided, in proportions varying from year to year, mainly between the growers of export wheats affected and European consumers.

"We see little prospect that the net gain to American wheat growers as a whole would be significant. Canadian wheat growers would stand to gain more, unless or until expansion of acreage wiped out the price benefit. The rate of expansion of wheat growing in the Prairie Provinces of Canada might be the determining factor. There is a fair possibility that, with expansion of acreage in Canada, farm prices of wheat in the United States might tend to be lowered by the opening of the St. Lawrence seaway. Some time in the 'forties the divergent views on incidence will be tested in the crucible of experience."

This is at least the third report from unimpeachable and impartial economic authority raising grave doubts as to the soundness of the St. Lawrence seaway project. Others have been the study of the project made under the aegis of the Brookings Institution, Washington, in 1929 and the other the recent examination of the undertaking from a Canadian point of view made by Professor W. T. Jackman of Toronto University and summarized in the *Railway Age* of April 9, page 599.

The directors of the Food Research Institute are Carl L. Alsberg, formerly chief of the bureau of chemistry in the Department of Agriculture; Joseph S. Davis, noted economist and statistician; and Alonzo E. Taylor, authority on food chemistry. The Institute was established in 1921 by the Carnegie Corporation and the trustees of Stanford University, one of the latter of whom is President Hoover, the leading protagonist of the St. Lawrence seaway in this country. His principal aide in furthering this project has been Ex-Senator Henry J. Allen, of Kansas, one of the leading wheat-raising states.

* Wheat Studies, Vol. VIII, No. 9, 24 pages, 8½ in. by 11 in., bound in paper. Published at Stanford University, Calif., by the Food Research Institute, price 75 cents.

Discuss Principles and Problems of Railway Supply Work

Contestants laud accomplishments in stores departments competition and advance ideas for progress

RAILWAY purchasing and stores departments and the leadership of the supply work were repeatedly praised, and the departments' problems and responsibilities reviewed, in a collection of papers submitted in the annual contest of the Purchases and Stores Division, A.R.A. The contest was the fifth conducted by the division to stimulate interest in supply work and while not as largely or as widely supported as previous contests, produced 21 papers, 9 from the Canadian National, 3 each from the Atlantic Coast Line and the Northern Pacific, 2 from the Central of New Jersey and one each from the Boston & Albany, the Baltimore & Ohio, the Chicago, Burlington & Quincy, the Missouri-Kansas-Texas and the Pennsylvania. In these papers the authors, comprising truckers, clerks, stockmen, and other supply employees, advanced various views and ideas for the improvement of the supply work.

In one of the winning papers William Courage, a trucker in a store-house on the Canadian National at Winnipeg, Man., held that past records are no longer of practical use in ordering material. "This method is effective in bringing about a reduction in stock but," he inquired "will the policy not impoverish the service to the using departments when business regains normal levels?" A record of previous prosperous years will in many cases prove of little value, he contended, because of rapid changes and improvements in the equipment as well as the changes in conditions affecting the use of material. The services to the using departments, he warned, cannot be curtailed beyond the safety point for operating costs will increase materially over any saving effected by the stores if serious shortages of essential material should retard or hamper the repair forces.

Interesting the Employee

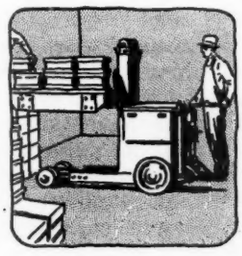
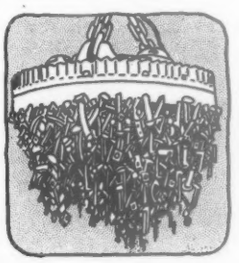
As a means of interesting and educating stores employees, P. J. Hurley, an invoice clerk on the Canadian National at St. Malo, Que., the author of the second winning paper, took the position that employees should rotate in the various positions in the stores department. "Why not," he said "assign section stock keepers to other positions in the stores department for a month or two in order to change their state of mind." This procedure, he continued, would create more interest on the part of the employees, educate them and place them in a position to co-operate more effectively in effecting improvements.

J. C. McGowan, stores attendant on the Atlantic Coast Line at Tampa, Fla., advocated the more general adoption by storehouses of material delivery. "The simplicity of a well-ordered delivery system," he said, "makes one wonder why it has not been used for a longer period of time. An ordinary laborer will deliver in one trip material which, under the old system, required the time of several mechanics and helpers." A store department is also benefited by the delivery system, he explained, by having requisitions to cover all the material which has been issued and the material is more accurately described.

The Atlantic Coast Line, said the writer, has developed a practice in connection with the delivery work which aids the storekeepers in anticipating future requirements. When it is noticed by the delivery forces that an article is being used much faster than anticipated and the amount in stock has reached a critical level, a delivery attendant fills out a card with the date, item number and remarks, the small end of which is then detached and left in the bin with the material while the other record is passed to the stock clerk for action either in enlarging the quantity of material ordered or in expediting the delivery of that due on orders issued. As the material is received, the two parts of the card are matched and filed. The small card in the bin is a reminder to the attendant that an unusual withdrawal of the stock has occurred and is a preventative against other attendants duplicating the order.

One way to operate a store department with the minimum investment in materials, according to M. C. Brinson, assistant division storekeeper on the Atlantic Coast Line at Waycross, Ga., is to adhere strictly to the practice of checking the quantities of materials on hand each month. These checks, he said, will occasionally show an increase in stock as compared with the records of the previous months. When these increases are not accounted for by material received on orders during the month, they should be studied. Such investigations will often disclose that material has been received and placed in storage under the wrong name.

Materials reclaimed or manufactured in a railroad shop should be ordered and handles exactly like mate-

rial purchased from outside concerns, Mr. Brinson also pointed out, and as a means of reducing the amount of surplus and slow-moving stock each storehouse should furnish all other storehouses with copies of their requisitions so that the copies can be checked against the surplus stock and the items transferred whenever practicable. As a further means of reducing inactive stock, all surplus and slow-moving items, he contended, should be marked so that they can be easily distinguished from active material.

Equipment Saves Labor

J. M. Warren, Jr., oil house attendant on the Atlantic Coast Line at High Springs, Fla., advocated the more extensive use of power-lift trucks, stating that a machine of this type enables one man to perform work that would require from 10 to 20 men with old type warehouse trucks. The possibilities of skids are also far reaching, he emphasized. There are hundreds of items that can be handled and stored on skids. Nearly all items can be shipped on skids and when empty, they can be returned to the general store loaded with scrap.

Considering the factors in the control of the material balance, H. J. Healy, assistant storekeeper on the Boston & Albany at Springfield, Mass., expressed the opinion that by giving special attention to active material, storekeepers should be able to reduce their stocks of such material from three months' protection to two months'. The present economic situation, he said, is the storekeeper's opportunity. As a means of avoiding the accumulation of inactive material, the author also advocated the closer study of reclamation as one of the sources of second-hand material worth special attention. Regardless of where the reclamation takes place, a large supply of inactive material will accumulate unless it is controlled. There is no gain, he added, in reclaiming beyond actual requirements.

Stock Books and Purchase Orders

E. J. Dennedy, stock clerk on the Baltimore & Ohio at Ivorydale, Ohio, favors the use of single item stock records and blanket contracts as a means of modernizing supply work. The one-item stock record, he explained, may be used either in looseleaf binders or in a visible panel arrangement. The steel panel cases afford more visibility, but involve considerable initial expenditure whereas all the benefits of the one-item card can be obtained at less expense by using a looseleaf binder. The one item record can be used for several years. The annual inventory can be taken in conjunction with this record. New items can be placed in their logical order at any time without rewriting the stock sheet and the arrangement also eliminates the necessity of maintaining hundreds of stock sheets at smaller stores which are never used.

"Since industrial manufacturers and jobbers are equipped to supply the railroads, why not," Mr. Dennedy asked, "take advantage of this condition and transfer some of the railroad storage problems to them by the use of blanket orders wherever their standing orders can be arranged satisfactorily by the purchasing agent?" Many roads are now receiving such materials as oxygen, acetylene, ice, gas, wheels, and sand on such orders and the principle can be extended to include such items as air-brake materials, pipe fittings, electrical supplies, and steel and malleable castings. The blanket order enables the roads to operate with less stock since the road is fully protected with the stock of the manufacturer or jobber.

E. R. Pirrie, material tracing clerk on the Canadian National at London, Ont., referred to the value of conferences between the heads of the using departments and the stores department as a means of promoting efficient and economical storekeeping. The stores department must necessarily be free from the influence of other departments, he said, but a spirit of close co-operation must be shown if satisfactory stores work is to be obtained. The ordering of material in excess of requirements as well as needless shortages can be avoided by holding meetings at which the using departments can present their needs and a better understanding of each departments' problems and conditions encouraged than is possible by correspondence.

Handling Track Material

In a paper on the conservation of materials P. F. Padberg, storekeeper on the Canadian National at Sioux Lookout, Ont., gave an illustration of the possibilities in material conservation. The estimated requirements of shims for track in that territory are no longer distributed in full in advance of needs, but are supplied to each section to the extent of about 40 per cent of the estimated requirements and the balance are shipped only as called for, in the same manner as other track material is now distributed along the line. This practice, he said, has reduced inventories and waste.

One of the most important aids to a supply organization D. A. Evans, storeman on the Canadian National at Stratford, Ont., pointed out, is the full co-operation of all employees in the prevention of fires. Acts are committed daily by employees, he said, which, if not counteracted, are likely to result in fires costing thousands of dollars.

Direct Shipping Saves

One way to meet the problems of the depression, in the opinion of A. V. Bass, requisition clerk in the stores department of the Canadian National at Moncton, N. B., is to move materials direct from manufacturers to the local stores. Direct shipment from supply contractors, he said, has been adopted to a greater or lesser extent by all railroads, but should especially be extended to many articles such as electrical materials which are required locally in large quantities each month, but which the local storekeepers obtain from other storehouses. More direct shipping to local storekeepers would make it unnecessary to retain such large stocks at district stores for general distribution. Many of the causes which led to the establishment of large distributing stores on the railroads, he contended, no longer exist. For example, there is less trouble in securing satisfactory goods and deliveries from contractors are also quicker and more certain than before. The shipping of material from a contractor to a general store and then to a district store and subsequently to a local store is uneconomic when prompt deliveries can be made direct to the local storekeepers or to the users by the supply contractors.

Watching the Prices

In a paper on the duties of a stockkeeper, G. N. Baker, Jr., stenographer on the Canadian National at Ottawa, placed emphasis on the importance of a stockkeeper taking an interest in the prices charged for material carried and reporting any apparent irregularities in the prices marked on the material.

F. C. Lutz, roadway stockkeeper on the Canadian National at Halifax, N. S., appealed for more co-operation in supply work. In many respects, made more evident during the depression, the ordinary employee, he said, has it within his power to make or break the rail-

(*Continued on page 369*)

Survey of Truck Transportation

Government investigators find statistical information scarce

WASHINGTON, D. C.

THE Department of Commerce has just made public a bulletin reporting the results of a survey of intercity motor-truck freight transportation for hire, conducted in 1931 jointly by the Bureau of Public Roads of the Department of Agriculture and the Bureau of Foreign and Domestic Commerce of the Department of Commerce. The principal objects of the investigation were to secure available data on (1) motor equipment in use, particularly as to types and weights of vehicles, (2) radius of haul, and (3) costs of operation. The survey was made under the general supervision of E. W. James, chief, division of highway transport, Bureau of Public Roads, and A. Lane Cricher, chief, division of transportation and communication of the Department of Commerce.

The information was secured, through personal interviews, from 217 motor-trucking concerns in 41 states and the District of Columbia. Data as to truck and trailer equipment were generally available, especially from operators making regular trips over fixed routes. Comprehensive figures on operating costs, however, were scarce, only 122 firms supplying cost data in sufficient detail to permit statistical analysis. The inadequacy of accounts and records for the industry as a whole, the report says, may be attributed to numerous circumstances, but its rapid growth, the large proportion of small-scale operations, and unstable competitive conditions are probably the most important. Although it is stated that there is apparent some tendency toward consolidation and large-scale operation in the motor-freight field, the industry is said to be still predominantly one of small fleets and individual management, with scientific accounting the exception rather than the rule. For this reason, the report says, statistical conclusions must be accepted only as indicative of general tendencies, not as final evidence on the subject.

Of the 217 operators included in the survey, 103 reported a common-carrier business only, 41 contract hauling only, while 73 reported both common-carrier and contract hauling. Only 60 reported gross revenue of $100,000 or over for 1930, and only 11 operated 50 or more vehicles. Of the trucks included 322 had a rated capacity of ½ to 1¼ tons, while 1,685 were of medium capacity, 1½ to 3 tons, 819 were listed as of heavy capacity, 3½ tons and over, and no capacity data was given for 89.

The 2½-ton truck is said to be the most favored size for intercity commercial hauling. In a total of 2,826 trucks for which capacity information was supplied, 510 were in this class, slightly over 18 per cent. Actually, however, these 2½-ton trucks handle large overloads. One of the more important aims of the survey was to obtain data relative to weights of trucks and loads carried. So far as it was obtainable, information was recorded covering the tare weights of the trucks used, the "usual load" carried, and the gross weights of the loaded trucks. The "usual load" was taken to mean not an average load but that load which the operator regarded as a normal or capacity load for a given vehicle, assuming sufficient freight was available. For 121 light trucks the usual load was reported as averaging 3,129 pounds, while for 1,037 medium trucks the average was reported as 8,132 pounds, and for 592 heavy trucks the average was given as 13,690 pounds, making the average for 1,784 trucks 9,585 pounds.

Overloading Frequent

Loading in excess of manufacturer's rated capacity was found to be very general, especially on the medium capacity trucks. Usual loads were reported in rare instances as high as three times the manufacturers' ratings. Normally, however, the excess was less than 125 per cent. Approximately one-fourth of all trucks and more than one-third of the medium capacity trucks were reported as carrying 100 to 125 per cent above capacity —roughly double their rated capacity. Nearly two-thirds of the heavy trucks carried less than 50 per cent above capacity.

Pneumatic tires are said to be rapidly displacing solid tires on motor trucks. The National Automobile Chamber of Commerce reports that only 3.6 per cent of the total output of motor trucks in 1930 were equipped with solid tires. However, the report points out, there are still many older trucks on the roads that have not been converted into pneumatic equipment, and analysis revealed that 24 per cent of the trucks and tractor trucks and 32 per cent of the trailers reported were on solid or "cushion" tires on one or more axles.

The distances over which trucks are being operated, as reported in this investigation, gave no clear evidence as to the profitable radius of motor hauling. Regularly scheduled runs were reported in excess of 500 miles between terminals. Occasional hauls were reported up to 2,500 miles. "Some of the long hauls have proved unprofitable," according to the bulletin, "others apparently were continuing successfully, but it is clear that no definite limit can be set for motor hauling."

"A clear distinction should be made between the expressions 'length of haul' and 'length of route'," the report points out. "Where a trucking concern operates between two large centers of population, the bulk of its freight will move the whole distance, especially if the trucks make an overnight run while business houses are closed. Commodities, however, are not always carried from one terminal of a route to another, but are frequently picked up or delivered enroute. In the final analysis, it is the rate that an operator can obtain for hauling that determines the distance to which he will go. Rates, however, depend on many circumstances. For superior service by truck a shipper will pay only as much in excess of competing transportation rates as any added advantages of truck transportation may be worth. No study of rates and rate-making for truck hauling was attempted during this survey. In general, it may be said that truck rates are frequently based on rail tariffs where a competitive condition exists, the truck rates being either slightly higher, to cover pick-up and delivery costs, or approximately the same. However, there are many exceptions to this generalization, as, for example, where the rates are further reduced through competition between rival truck lines or where special commodity rates are made.

"The number of operators who reported regular hauling over fixed routes was 182, or 84 per cent of the

number interviewed during the survey. Although routes over 250 miles in length and extending as far as 530 miles were reported, their number was so small that they have been shown only as routes longer than 250 miles. It will be noted that about 95 per cent of the routes were less than 200 miles, 80 per cent were less than 120 miles, and 75 per cent less than 110 miles in length. Over half the routes were shorter than 70 miles. The largest group, those ranging from 31 to 40 miles in length, contained 10.5 per cent of the whole. The total number of routes reported was 562, with an aggregate length of 49,160 miles. The average length of route was 88 miles, ranging from an average of 35 miles in Maryland for six companies operating 36 routes to an average of 198 miles in Arizona for three companies with 10 routes."

70 Miles the Median Route

While the average was given as 88 miles, the report says that a truer picture of the typical truck route probably results from the medium figure, which was 70 miles for the United States. From a table showing the average length of fixed routes in different sections of the country it is noted that the average for the West North Central section is practically the same as for the United States as a whole, while those for the East South Central, West South Central, Mountain, and Pacific states exceed the average for the country. Of the total of 562 fixed routes reported, 154 were interstate. While the small number of reports from some of the states prevents the drawing of too definite conclusions, the report says that certain general tendencies may be pointed out. For 101 operators in states west of the Mississippi the medium length of 266 routes, covering 27,361 miles, is 80 miles, while for 81 firms east of the Mississippi, with 296 routes totalling 21,799 miles, the median is 60 miles. In 10 states in the southwestern part of the country 40 concerns, operating over a total of 13,006 miles on 112 routes, have a median route length of 95 miles.

Some additional extracts from the report follow:

Hauling to points not on fixed routes, commonly referred to as "anywhere for hire," was carried on not only by operators who had no fixed routes but also by many carriers in addition to their scheduled trips. Specific data regarding length of haul were naturally difficult to secure for these irregular movements. The operator himself frequently has no detailed record of where his truck or trucks have been working, except perhaps on the exceptionally long trips. Each of the "anywhere for hire" operators was asked his normal or usual hauling radius. For 70 operators, reporting irregular hauls other than "local," the average normal radius was approximately 119 miles, with a median of 100. The latter figure (100 miles) was also the most commonly reported, being named by 17 out of the 70 irregular operators. It is clearly apparent that estimates were made in well-rounded figures. Three operators reported 500 miles; 19, on the other hand, reported 50 miles or less, some of these hardly exceeding local limits. In addition to the 70 irregular haulers mentioned, there were five who reported only a normal "local" range for their work, this usually being a city transfer business. Eleven operators who occasionally made long irregular hauls furnished no information as to the normal range.

The distance a commodity can profitably be hauled by truck is, in actual practice, limited by the nature of that commodity. Such freight as wheat, coal, and building and road materials, whose weight or bulk are relatively high compared to their value, require special loading equipment and carriers of large capacity, such as freight cars or barges, if they are to be hauled long distances at economically sound rates. Other products, like household goods, poultry and livestock, perishables which suffer from excessive handling, silk, and similar commodities of relatively low weight or bulk and high value, can be hauled comparatively long distances at higher cost. Over the longer hauls trucks tend to specialize in the less-than-carload business, often equivalent to express service, although this is by no means universally true, as evidenced by bulk hauling of gasoline in tanks from Los Angeles 400 or 500 miles over the mountains to Arizona points.

By far the greater number of operators reported only "miscellaneous" or "general freight" hauling. Some of these also named the particular commodities which made up an important proportion of their business. Other firms specialized in particular commodities, like milk, automobile parts, household goods, oil and gasoline, etc. These special commodities were not listed often enough to permit of significant statistical tabulation, however, and no attempt is here made to compare the length of haul of different classes of freight.

Transportation Costs

A major object of this survey was the compilation of data relative to the cost of operating motor trucks, either as common carrier or contract carrier vehicles, in interurban freight service. While it was recognized that the wide variety of conditions under which motor-freight services are performed, as well as the numerous factors affecting individual operations, would modify any generalization on the subject of operating costs, it was felt that a presentation of actual cost figures contributed by motor-trucking concerns, noting the accounting practices in use, would be of value to the industry. An endeavor was made to obtain truck operating cost figures for the calendar year 1930, and this was successful in so far as fleet operating costs were concerned. Data on the cost of operating individual vehicles for a yearly period were scarce, and the figures in the unit cost table cover varying shorter periods of time.

Figures on operating costs, vehicle mileage, tonnage hauled, and other pertinent data were obtained directly from the books and records of the concerns interviewed. In some instances, these data were supplemented by extracts from the companies' reports to the State regulatory commissions. Cost information was generally scarce, but much more material was available in those states requiring periodic reports from motor-freight carriers.

The actual cost of commercial transportation over the highways is difficult to obtain and only comparatively meager knowledge is available from present records. This is perhaps the principal conclusion to be drawn from the cost study here reported, although such figures as were obtained are, it is believed, significant and valuable. Some cost data were received from every concern reported upon, but much of the material collected was not susceptible of the detailed analysis necessary for a study of transportation costs.

Some concerns, particularly the smaller ones, fail to include in their accounts items of legitimate expense, with the result that a false or excessive profit may be shown on the operation. This neglect is generally confined to the omission of overhead or administrative costs. The shortcomings appearing most frequently were failure to charge to the business a salary for its owner; not including compensation paid to member of family employed in the business; no allowance for rent, light, telephone, etc., when home and garage are used for office and storage purposes; no charge for maintenance and repair labor performed by owner; and the overlooking of miscellaneous petty-cash expenditures.

Contrary to an impression that has gained wide credence in some quarters, depreciation expense was not a neglected item of trucking cost. Very few of the concerns that furnished unit or fleet costs stated that no depreciation allowance was charged on their books.

Mileage and Tonnage Records

The value of cost data available was sometimes nullified by the absence of an accurate measure as a basis for studying and comparing costs. The cost of hauling, if it is to have significant meaning, can be expressed only in relation to service performed. Statistics as to truck-miles operated, tons of freight transported, and ton-miles hauled are essential—and extremely scarce.

The true measure of the cost of transporting goods over the highway is the cost of hauling a certain tonnage of goods a certain number of miles. The unit of measurement, the ton-mile, represents a load of one ton moved a distance of one mile. With few exceptions ton-mile figures were not available, despite the fact that the basis for determining such figures is to be had from the bills of lading or daily manifest sheets. The failure of concerns to summarize these bills of lading or manifest sheets prevented the development of these important data. Where the service rendered is a through haul between the point of origin and a limited num-

ber of destinations, the summarization of ton-miles is not difficult, but where service is performed over a number of routes, serving a number of points on each route the computation of ton-miles involves a great deal of detailed tabulation.

Ton-mile cost varies more widely than truck-mile cost. While there are fairly definite physical limitations to the per mile operating costs for trucks in normal use, the ton-mile cost depends almost wholly upon the average load carried. The ton-mile cost of a given haul will be reduced by almost half if the truck can return loaded instead of empty. In other words, ton-mile cost, which is a most accurate measure of hauling costs, is dependent upon the efficiency of the loading practice. Paradoxically, the less a truck carries, which is equivalent to saying the less efficiently it is used, the more cheaply it will operate, as measured by per mile cost, while under the same condition of partial loadings the per ton-mile cost will be high.

The cost per ton of transporting goods is not usually significant unless consideration is given to the length of haul, when it resolves itself into a ton-mile basis of calculation. For any particular concern or group of concerns, however, it may be helpful in comparing business done during successive periods of operation.

Nearly all of the concerns reporting in this survey furnished some sort of information regarding operating costs, but in only 122 cases was it sufficiently complete for analysis. Unit operating cost figures were obtained for 146 vehicles or combinations of vehicles, operated by 39 firms.

These vehicles were selected in the field after consultation with the operators as typical units engaged in intercity hauling.

Fleet operating costs were supplied by 91 concerns operating a total of 2,380 vehicles of various capacities and types, including trailers.

The 146 vehicles for which unit-cost figures are given include 126 trucks, 9 tractor truck-trailer units, 2 truck-trailer units, and 9 trailers.

Trucks have been divided into three ranges, according to rated capacity. The medium-duty range includes trucks of 1½ to 3 tons capacity; the heavy-duty range, 3½ to 5 tons capacity; and the extra-heavy-duty range, over 5 tons. This division is not based on any particular standard, but to permit an equitable comparison within a range, between vehicles not too dissimilar in character.

Ton-mile figures in some instances were taken direct from station-to-station tonnage data. More often they were derived from an estimated average load (including empty as well as loaded mileage) multiplied by the miles operated. They are an approximation; obtained, however, from the operators themselves.

An approximation of gross expenses per mile for the several truck-capacity groups may be reached by adding to each figure for total direct operating costs a proportionate addition to cover the overhead costs. This, of course, is equivalent to allocating the overhead costs in proportion to direct operating costs. The analysis of fleet costs shows that direct operating cost averaged 57 per cent and overhead cost 43 per cent of the total. On this basis the accompanying table gives an approximate gross expense per truck-mile for medium, heavy, and extra heavy trucks.

Gross Expense Per Truck-Mile, by Rated Capacity Groups

Rated capacity	Direct operating costs (57 per cent)	Overhead costs (43 per cent)	Gross expense (100 per cent)
1½ to 3 tons	$0.1513	$0.1141	$0.2654
3½ to 5 tons	.2005	.1513	.3518
Over 5 tons	.2183	.1647	.3830

Most of the cost data are shown in the form of a table giving figures for individual trucks, for only a few of which was the information sufficient to give an average. For 69 medium-capacity trucks the average direct operating cost per truck-mile was given as $0.1513, and that per ton-mile as $0.0695. The ton-mile costs ranged from $0.0221 to $0.1449. For 37 heavy-duty trucks the average was reported as $0.2005 per truck-mile and $0.0704 per ton-mile. The ton-mile cost ranged from $0.0508 to $0.1554. For 20 extra-heavy-duty trucks the average per truck-mile was given as $0.2183.

A British Self-Trimming Coal Bunker

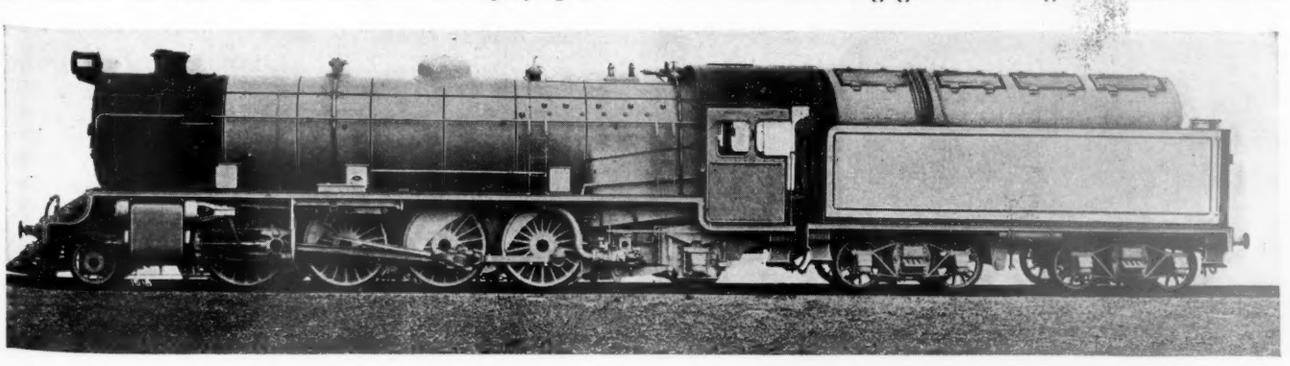
OVER 30 London, Midland & Scottish locomotives have been equipped with self-trimming tender coal bunkers. They are designed for application to tenders used behind hand-fired locomotives and eliminate the necessity of shoveling coal forward by hand, and are manufactured by Beyer, Peacock & Company, Ltd.

The bunker is constructed in the form of a frustum of a right-circular cone, with the large end toward the front of the tender. Three loading hatches are provided, the doors of which can be closed and securely fastened, as shown. The bunker is rotated by two steam engines of small capacity to move the coal forward. A feature of the enclosed type of coal bunker is that it prevents coal dust being blown into the cab or along the train, according to the direction the locomotive is traveling. It also prevents rain and snow getting into the coal.

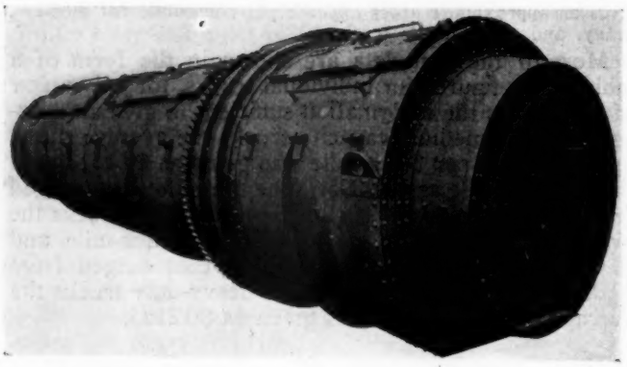
The bunker is installed with the axis inclined toward the front of the tender and with the top horizontal. Thus the floor of the bunker has sufficient slope to permit the packed coal to slide forward with only a few revolutions of the bunker. The small or back end of the bunker is carried on a roller bearing in a vertical bracket which is secured to the tender. It can also be carried on rollers, if desired.

The forward or large end of the bunker is carried on rollers which engage a circular track of cast steel around the bunker. This track, which has a vertical flange surface to take the forward thrust against the rollers, is located between the forward and middle hatches.

Adjacent and parallel to the roller track is a rack rail. This rack engages a worm gear which is driven



A 2-8-2 Type Locomotive Equipped with the Beyer-Peacock Self-Trimming Coal Bunker



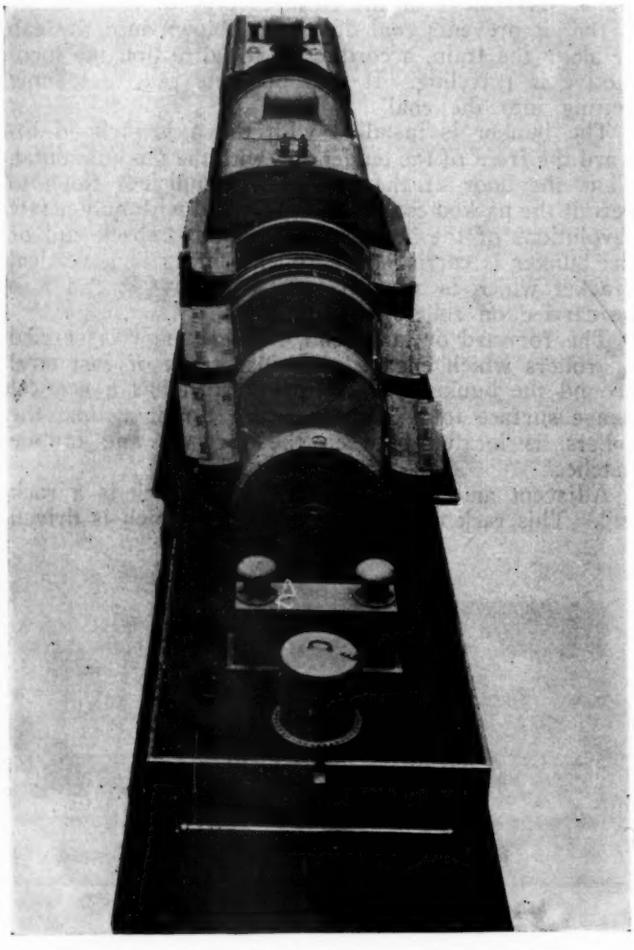
Self-Trimming Coal Bunker Showing the Door and Roller-Rail Arrangement

by two steam engines of small capacity, one on each side of the tender. These engines can be reversed as desired so that the bunker can be revolved in either direction. The throttle is located in the cab.

The bunker can be revolved in 30 seconds or less if desired. Experience in actual operation has shown that three or four revolutions are sufficient to cause the coal at the rear of the bunker to be moved forward within easy reach of the fireman. The door at the front end is made in two sections. The bottom section slides up over the top section when firing. Clamps are provided to lock the door securely when the bunker is to be revolved.

The rotating action of the bunker tends to mix the lumps and fine coal so that the fireman always has the best coal available at all times.

Most of the installations of this self-trimming coal bunker have been on tenders behind London, Midland & Scottish locomotives of the "Byer-Garratt" type. These locomotives, which are largely used in heavy freight service, are hand fired, but have relatively large grate areas and require large bunker capacity.



Top View of the Bunker With the Hatches Open

Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading in the week ended August 27 totaled 537,973 cars, an increase of 19,331 cars as compared with the week before, following successive increases in the two preceding weeks. This was a reduction of 225,578 cars as compared with the corresponding week of last year and of 446,537 cars as compared with 1930. Increases as compared with the preceding week were shown in the loading of livestock, coal, coke, forest products, merchandise, and miscellaneous freight. The summary, as compiled by the Car Service Division of the American Railway Association, follows:

Revenue Freight Car Loading

Week Ended Saturday, August 27, 1932

Districts	1932	1931	1930
Eastern	120,178	170,614	218,141
Allegheny	98,937	150,671	197,725
Pocahontas	36,820	49,172	56,571
Southern	79,022	105,059	130,426
Northwestern	70,421	111,564	157,936
Central Western	86,927	117,193	145,533
Southwestern	45,668	59,278	78,178
Total Western Districts	203,016	288,035	381,647
Total All Roads	537,973	763,551	984,510
Commodities			
Grain and Grain Products	37,969	40,220	59,658
Live Stock	19,196	24,317	24,554
Coal	94,605	134,488	168,879
Coke	2,878	4,868	8,483
Forest Products	16,495	28,026	42,824
Ore	7,210	34,927	55,748
Mdse. L. C. L.	171,478	214,591	239,322
Miscellaneous	188,142	282,114	385,042
August 27	537,973	763,551	984,510
August 20	518,642	748,600	940,558
August 13	512,431	743,626	922,823
August 6	496,033	734,730	904,157
July 30	510,687	761,818	919,781
Cumulative total, 34 weeks	18,110,084	25,035,724	30,652,260

Car Loading in Canada

Car loadings in Canada for the week ended August 27 amounted to 40,825 cars which was an increase over the previous week's loadings of 1,173. This raised the index number from 65.64 to 66.59.

	Cars Loaded	Rec'd from Connections
Total for Canada		
Aug. 27, 1932	40,825	15,956
Aug. 20, 1932	39,652	14,610
Aug. 13, 1932	39,152	15,444
Aug. 22, 1931	47,633	21,548
Cumulative Totals for Canada		
Aug. 27, 1932	1,380,106	653,276
Aug. 22, 1931	1,631,175	890,219
Aug. 23, 1930	2,014,721	1,150,939

APPROXIMATELY 20 PER CENT of the freight cars of the Imperial Government Railroad, the most extensive railway system in Japan, are idle, according to a report to the Commerce Department. Out of 65,138 freight cars owned by the I. G. R. 12,951 are not being used, while 3,000 more have been withdrawn from service and will be dismantled. During 1931 the month of August showed the highest number of idle cars, the figure at that time being 14,000 cars. The fact that this number has increased to around 16,000 for July, 1932, indicates the fall in railway traffic which has occurred recently. The railway authorities are also understood to be considering withdrawing 5,000 more cars as being unsuited for service.

Interior of One of the New York, New Haven & Hartford Air-Conditioned Dining Cars, Showing the Air-Conditioning Distribution Nozzles

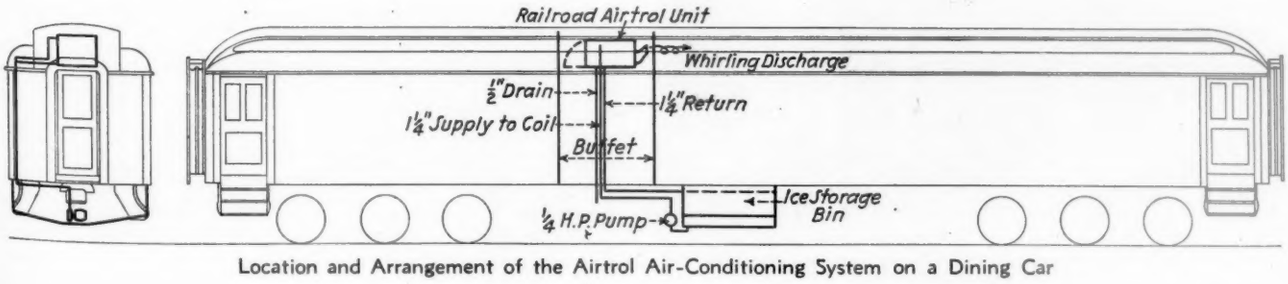
New Haven Applies Air Conditioning to Diners

Airtrol system employs a compact unit with provision for winter heating and humidification, and self-contained air distribution

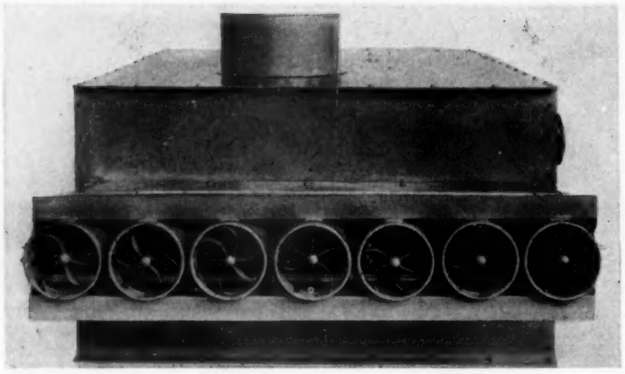
TWO dining cars of the "Yankee Clipper" operating on the New York, New Haven & Hartford between New York and Boston have been equipped for air conditioning with a system which utilizes ice as the cooling medium and which employs a simple, but unique system of air distribution within the dining rooms of the cars. This system, known as the Airtrol air-conditioning system, which is marketed by the Rails Company, New York, provides for complete air conditioning both winter and summer, with provisions for proper humidification during the heating season.

As installed in the New Haven cars, the system consists of two units: The Airtrol railway unit, which is placed above the ceiling over the buffet, and the ice-storage bin and cold-water circulating pump, which is located underneath the car. The cabinet of the Airtrol unit occupies a space, 46½ in. long by 32 in. wide and 18 in. high and weighs 260 lb. It contains a humidifier; a fin-coil radiator, which is utilized both for cooling and heating the circulated air; an air filter, and a motor-driven fan with centrifugal type impeller. The fan rotates in a horizontal plane and the direct-connected motor projects a few inches above the unit.

Air enters the unit through the humidifier, fresh air entering through ducts with openings in the clerestory at either side of the car, the recirculated air flowing to the unit through a grille in the buffet ceiling. For summer use the humidifier is inactive, the air flowing through the heat transfer coils where it is cooled and the necessary dehumidification effected automatically. Thence the air passes through the filter to the fan, to be discharged directly into the dining room through seven 4-in. nozzle openings through the transom over the archway between the dining room and the buffet. These nozzles, the location and arrangement of which can be seen in the illustration showing the interior of the diner,



Location and Arrangement of the Airtrol Air-Conditioning System on a Dining Car



The Front View of the Airtrol Unit, Showing the Distribution Nozzles with the Direction-Controlling Whirls in Place

each contain vanes which impart a whirling motion to the air as it is discharged from the nozzles. These vanes are also adjustable to control the direction of the discharge from each nozzle.

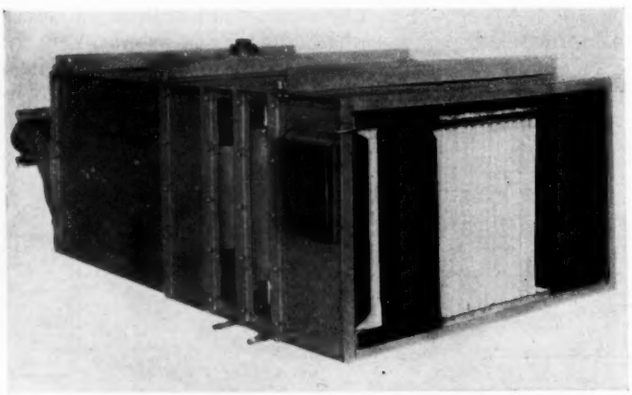
In the New Haven diners the ice-storage bin has a capacity of 1,500 lb., an amount which is determined by local conditions. Cooling water is drawn from the storage bin by a motor-driven centrifugal pump to be circulated through the cooling coils, and thence returned to the storage bin where it is sprayed over the ice. The heat-transfer coils in the Airtrol unit are piped both for cooling and heating. For the heating season a change in the valves disconnects the cooling-water system and connects the steam-heating system to the heat-transfer coils. The humidifier is then placed in operation, the heating system supplying the moisture to textile screen humidifying surfaces through which the fresh and recirculated air passes to the heat-transfer coils and circulating fan in the same manner as for summer cooling.

The directions of the whirling streams of cold air from the seven nozzles are fixed to cover uniformly the entire width of the dining room. The whirling discharge causes a rapid enlargement of the air streams and thus effects a thorough mixture of the cool air with the air contents of the dining room, from which the recirculated air is drawn through the grille in the buffet ceiling at the rear of the unit.

A number of tests conducted on the diner "Dreadnaught" of the New Haven while in regular service during the past summer all indicate a satisfactory uniformity in the air temperatures throughout the dining room while the system is in operation. In one case the car entered service after having stood 2½ hours in the sun on a humid day when the outside temperature in the shade was 85 deg. The temperature on the interior of the car, taken at several points on both sides, stayed at 85 deg., with the temperature 1 ft. below the ceiling at 90 deg. On starting the unit the air at the recirculation intake grille registered 84 deg. Thirty minutes after the unit was started, when the train left the terminal, the temperature had been reduced by 10 deg. on the left side of the car and about 8 deg. on the right (sunny) side of the car. The temperature was 1 deg. higher at the buffet end of the dining room than at the opposite end farthest away from the air discharge nozzles. At the end of 1½ hours the difference in temperature between the two sides of the car had been reduced to 1 deg., the car thermometer on the sunny side registering 76 deg. and on the opposite side 75 deg. The temperature at the buffet end on the sunny side was 77 deg. and on the same side at the opposite end of the dining room, 76 deg. The lowest temperatures on the interior of the dining room at that time were 73 deg. which were registered, respectively, about two-thirds of the way down the left side of the car, and at the center of the car, 1 ft. below the ceiling and 2 in. from the floor. Before the unit was started the relative humidity in the car was 61 per cent. One and one-half hours later this had been reduced to about 47 per cent. The temperature of the cooled air leaving the nozzles varied between 54 and 55 deg., and the temperature of the recirculated air entering the intake grilles was 78 deg.

The single Airtrol unit is sufficient to care for a space up to 4,500 cu. ft. which is sufficient for the dining-room space in the dining car. In cars where air conditioning must be applied to a space larger than 4,500 cu. ft., two units are installed at opposite ends of the space. In such cases a single ice tank services both units, but each unit may be provided with a separate motor-driven water circulating pump.

A single unit requires two ¼-hp. motors. The circulating-fan motor operates at 720 r.p.m., while the centrifugal-pump motor operates at 1,750 r.p.m. The system is rated as the equivalent of four tons of refrigeration. The pump motor is designed to circulate approximately 16 gal. of water per min. at temperatures of 35 deg. in, and from 40 to 42 deg. return. It operates intermittently under thermostatic control. The fan motor operates continuously, delivering a total of 1,200 cu. ft. of air per min., 300 cu. ft. of which is fresh air taken in from the outside and 900 cu. ft. of which is air recirculated from the interior of the car. Two reduced fan-motor speeds are available where conditions require less than the full capacity air circulation. Under full capacity, the air leaves the nozzles at a velocity of approximately 2,000 ft. per min. During the heating season the operation of the humidifier is subject to automatic hygrometer control, and the heating-transfer coil is thermostatically regulated by floor temperature.



Rear End of the Airtrol Railroad Unit, Showing the Interior of the Humidifier

Unusual Concrete Bridges are Built on the Canadian National

(Continued from page 357)

in., this ranging about 15 to 17½ per cent higher, with corresponding increases in the yield point and percentage of elongation, and with satisfactory cold bend tests. No waterproofing was used on the decks which were poured-in-place, reliance against percolation into or through the concrete being placed in the dense concrete used and a suitable drainage pitch in the deck slabs.

On the precast slabs on the other hand, a membrane was used under the concrete ties.

All the structures described were designed in the bridge department of the Canadian National, Toronto, Ont., under the direction of C. P. Disney, bridge engineer; T. T. Irving, chief engineer; and W. A. Kingsland, general manager. B. A. Baldwin was engineer in charge of construction.

N. Y. C. Installs Mercury-Arc Rectifier

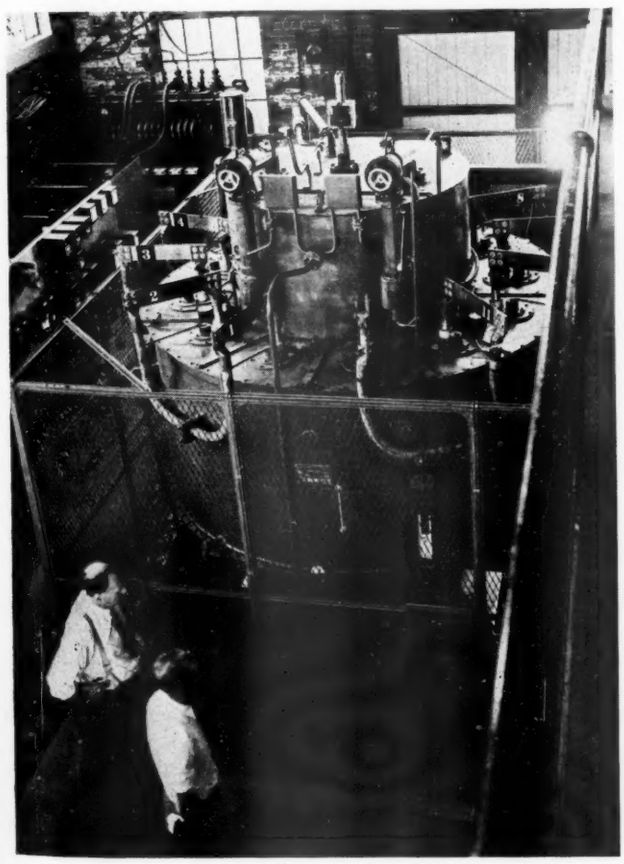
By G. R. McDonald*

THE New York Central has installed in its Wakefield, N. Y., substation a 3000-kw., 666-volt mercury-arc rectifier to operate in multiple with the 2000-kw. motor-generator set already in service. The starting and stopping of both of these units is accomplished by remote control. Both machines are provided with automatic control equipment. The generator of the motor-generator set is equipped with a counter e.m.f. voltage regulator which is biased by means of a current coil to give the generator a straight line drooping characteristic from zero load to 150 per cent load. At 150 per cent load a current relay functions to maintain constant current output. The rectifier transformer was designed to provide the rectifier with a characteristic giving the same regulation as the generator. The rectifier, however, is not provided with load-limiting resistors or any other method of limiting the output current, although provision was made for adding a step of load limiting resistance in the future if found necessary. The rectifier and motor-generator set share the load very well through the load range.

The rectifier has fully demonstrated its suitability for this type of service by its ability to operate alone during the peak load period and carry repeated load swings of short duration to 300 per cent of its normal rating.

Cooling of the rectifier is accomplished by means of a heat exchanger. The rectifier cooling water is circulated continuously through one side of the exchanger. Tap cooling water is admitted to the heat exchanger as required. This method of cooling prevents a large temperature gradient through the rectifier.

* Transportation Engineering Department, General Electric Company, Erie, Pa.



The Rectifier as Seen from the Sub-Station Balcony

Discuss Principles and Problems of Railway Supply Work

(Continued from page 362)

roads. It is important that each worker should consider himself not only an employee, but a partner and do all in his power to promote the best interests of the road.

Supply Work in the Future

There is no other purpose of the store department, J. C. Windbigler, store helper on the Missouri-Kansas-Texas at Parsons, Kan., warned, than that of service to the roads through the dollars saved over other methods of distribution of material. The best interests of the railroad must be the first consideration. The supply organizations, he said, are now facing a crisis and the future will determine whether the department will rise to a higher level of service or sink by the relegation of the work to other departments. It is incumbent upon the stores forces, he contended, to leave nothing undone to produce actual and convincing evidence of the usefulness of the department and the extent of the service rendered.

Stationery stores do not receive a great deal of attention, in the opinion of R. C. Stenback, store helper on the Northern Pacific at St. Paul, Minn., but the doorway to economy and increased efficiency is to be found in this branch of service. Among the methods advocated by Mr. Stenback to secure economy were the use of packages of standard sizes, the standardization of forms including the reduction of letter-size paper from 8½ in. by 11 in. to 7½ in. by 9½ in., and conferences of the stationery storekeepers of various railroads to secure the economies of group printing.

Savings in Scrap Handling

Discussing the problem of scrap disposal on railroads, N. J. McDonald, sales clerk in the purchasing office of the Pennsylvania, proposed several ways by which the efforts already being made in collecting, sorting and selling scrap can be augmented to the best interests of the railroad. This should consist, he said, (1) of a survey of the raw material needs of scrap consumers, made by personal visits to plants and by questioning representatives that visit the purchasing agents offices; (2) of efforts to fill the requirements of the railroads with old material; (3) of co-ordinating the buying and selling functions in the purchasing agents' offices, and the ordering and scrap offering functions in the storekeeper's offices to keep users of materials and scrap collecting agencies posted as to the special salvage value in certain materials purchased; and (4) of avoiding the purchase of material where scrap already on hand can be substituted for it.

Communications . . .

Concerning Railway Salaries

ROANOKE, VA.

TO THE EDITOR:

I noticed your article in the *Railway Age* of July 30, on the subject "Should Railways Pay for Brains?"

For the information of Senator Couzens I would like you to compare the amount paid railway officials in a year, with the useless cost put upon them annually by the Interstate Commerce Commission in its system of accounting and its interference with their proper development. This also for the information of Commissioner Eastman.

I should like to see these figures placed side by side.

JOHN A. PILCHER.

Some Observations on Rail Services and Possible Economies

THE PLAINS, VA.

TO THE EDITOR:

I would like to express my ideas about how the railroads could improve their service and save money if they would undertake to carry passengers at 1½ cents per mile round trip, and two cents per mile one way rates and provide facilities outside of large cities, where land is comparatively cheap for their freight and passenger terminals, delivering both freight and passengers to all points beyond by motor cars, buses and trucks. Then dispose of the high priced lands in the cities and escape taxes on it. They should arrange their freight rates so any of their employees could learn them, understand them and be prepared to quote approximate rates to anyone at any time. For if it takes an expert to check rates on grain from Missouri to Ohio, it is no wonder that the average shipper feels as though he could save money if he could but know half the rates there are in one of the tariff schedule books. In contrast any truck driver can quote the cost of hauling almost anything at any time to any place if he knows the approximate distances involved.

I could enumerate several specific cases which make me conclude that the above remedies are certainly part of what is needed to help put the railroads back on their feet. But one other thing I would like to discuss. It is in connection with the fight which the *Railway Age* is carrying on to secure regulation of trucks and buses, and to free the railroads from undue regulation by government bodies. While I feel that you are pointing in the right direction, I would like to call your attention to some facts which I have observed.

The first is that practically no one believes the railroads are unduly legislated against, for the public doesn't imagine the existence of one-fourth the laws and regulations that are in effect. A congressman with whom I recently discussed railroad problems told me he did not see why the railroads had not undertaken store-door delivery and gone into trucking. I suggested they were very much hampered by regulation laws and his reply was that he imagined they could get around these laws very easily with subsidiary companies if they really wanted to. That was his firm belief and it is a reflection of the attitude of the average person. They believe the railroads can get around any regulation or law made if they want to do it very much. The best way to overcome such an idea is for the railroads to agree on a wholesale violation of all such rules and regulations in a certain district.

Nothing would convince people of the cost of government operation of the railroads like having the railroads stop paying any taxes for six months or a year. The portion of the taxes paid by the buses and trucks would be illustrated by paying only a corresponding amount of tax based on the number of tons of coal used in each state, plus a realty tax on the station building, where it is used as a waiting room, but not any of the ground used as coach yards or covered by any tracks, as the tax on coal would take care of these latter. There is nothing which would bring local politicians to the aid of the railroads like a realization of the amount of county income that would be lost if the railroads should fail to make money.

Why don't the railroads advertise and run depression trains carrying traffic at rates based on twelve-hour train crews at pay corresponding to that of truck and bus drivers, so people could see how much the maintenance of high wages and union hours is really costing them.

WILLIAM GORDON LEWIS.

The Railroad Plight Is Our Plight

WATERTOWN, CONN.

TO THE EDITOR:

The plight of the railroads—the nearest approach to perfection in transportation man has yet invented—is no more the plight of the railroads than of our very existence.

Strange it is what false steps we take in search of a mythical substitution of an unknown quantity for a known quantity; but to err is human.

Proof that the railroads are vital to our very existence is simple.

Suddenly we find ourselves at war, the railroads are commandeered; they are so far ahead of any other mode of transportation in war emergency that comparison is ridiculous.

As suddenly we find even in peace that elements beyond control of man—violent floods or storms, pestilence or famine—cause shortage of the basic commodities of life in some part of our land or of the world. There is food or fuel to be rushed to a stricken area to prevent starvation and suffering. The railroads, our old faithful standbys, are pressed into immediate service for the relief of the needy. There is no other form of transportation that can as quickly, surely and economically meet the emergency, so as in all cases of real need we turn to strength for aid.

Then we bite the hand that feeds us, we put all sorts of regulatory restrictions on our railroads, kick over the rates charged, even though they insure us the necessities of life, and we permit other modes of transport, such as the motor truck and motor bus—affording no comparison as to comfort and safety—to come in and take the cream of our transportation business. Not only that, we go further and contribute to highway operation by furnishing a roadbed and freeing highway carriers from the great majority of the burdens we put on our railroads.

Then we cry out that motor transportation is cheaper than rail, that the latter must mend its ways and stop gouging us or it is doomed. We give no thought to the real cost of motor service for as long as the charges do not appear on the freight bill or passenger ticket we allow ourselves to be hood-winked as to the actual cost to us.

What we need is an awakening to the truth that it is not so much the railroads that are doomed or should mend their ways as it is ourselves that are doomed if we drive them out of our life.

Were we to contribute in any like proportion toward the cost of operating a railroad that we do toward the cost of operating a system that interferes with the railroads' success, and so our success, the railroads would today be able to make rates that would drive the motor competition to cover, and demonstrate the real economic value of one of the greatest engineering achievements in history.

May we never be dependent on a supply of tons and tons of fuel coming from the mines to the frozen north, hundreds and hundreds of miles away; nor grain coming half way across the continent by means of motor truck. We are certain to be both cold and hungry.

It is truly our plight; not that of the railroads. They are the very foundation of our physical structure and with the foundation weakened until it can no longer endure the whole structure of modern civilization collapses.

LLOYD SENIOR.

Odds and Ends . . .

Old Travel Problem Solved

A story from Ottawa discloses the manner in which two travelers solved the ancient problem of how to undress in a sleeping car berth with ease, dispatch and without physical torture. These travelers, both middle-aged Englishmen, arrived at the Union Station to take their train, wearing only top coats over their pajamas. They had donned sleeping attire at their hotel and, with porters carrying their baggage, they sauntered through the tunnel to the station and out onto the platform with vast unconcern in spite of the stares of crowds. In addition to their pajamas, one man is said to have worn a light top coat and a derby, while the other had a slightly heavier coat and a cane. Both wore bedroom slippers and a sleepy look.

Veteran Roadmaster

John Sexton, who retired recently as roadmaster of the Morris and Essex West End division of the Delaware, Lackawanna & Western, had quite a career. He went to work on the Lackawanna as a tool boy and flagman in 1875, so that he had 57 years of service behind him on the day of his retirement. He held the position of roadmaster on the Morris and Essex West End division continuously for 33 years. Mr. Sexton distinctly recalls the narrowing of the old broad gage, which was 6 ft., to the present standard gage of 4 ft. 8½ in. He also has vivid recollections of the unloading of coal into boats at Port Washington for transport to tide water via the Morris canal, the wood-burning locomotives in service at that time, and other such relics of earlier years. He also remembers when men received 90 cents for 12 hrs. work and were glad to get it.

A Royal Railroad Enthusiast

Boris of Bulgaria is a King, but he shares an enthusiasm for railroading with many commoners. He gave evidence of this enthusiasm recently when he granted a private audience to Augustus Phillips, a locomotive engineer from Falls City, Neb., who had returned to his native Bulgaria for a vacation.

"You know, railroading is my hobby," said King Boris during the course of the conversation. "We never have a new engine over here but that I pull the throttle and start the train going, just as your executives and statesmen launch merchant vessels and battleships."

The King and the locomotive engineer then discussed the merits of standard gage and narrow-gage track, and agreed that the narrow gage is unsatisfactory. King Boris also asked Mr. Phillips' advice about putting automatic stokers on Bulgarian engines. Mr. Phillips advised waiting until larger locomotives were in service and with this the King agreed, but possibly there is a lead here for some energetic stoker salesman.

More Clever Commuters

San Francisco, Cal.

To the Editor:

With regard to "These Wily Commuters": On a certain Pacific Coast road commuters who left their books at home (we use coupon books for commuters out here) could purchase a ticket from the local agent and secure a refund of the amount upon presentation of the receipt and the unused coupons. Some of the commuters, who were "enjoying" the benefits of the four or five-day week, learned to eke out their wages by going to the local station on their days off and purchasing a round-trip ticket, the receipt for which, together with unused commutation coupons, was presented later for the usual refund. Later, the round-trip ticket was presented for refund, and the commuter was that much ahead of the depression. Needless to say, this practice did not last very long.

The Northwestern Pacific has been carrying on an interesting experiment in its interurban area since last November. There are a junior college and several high schools in this territory, pupils being sold special low-fare commutation tickets. The students frequently leave their tickets at home, which presents an awkward situation for trainmen. For the past nine months trainmen have been taking the names and addresses of pupils without tickets, and letters are addressed to their parents asking that the unused coupons or cash be remitted to cover the cost of the ride. A great many cases of this kind have been handled, and it has been pleasant to read the complimentary letters that frequently accompany the remittances.

William S. Wollner,
General Safety, Fire Prevention and Welfare Agent, Northwestern Pacific.

A Challenge

The tank car repair department of the Mid-Continent Petroleum Corporation, Tulsa, Okla., has made quite a safety record, one which they are ready and even eager to stack up against the safety record of any railway car department. The company operates 2,189 tank cars. With 57 men employed in the tank car repair department, not one of them has lost time on account of an injury since January 28, 1930. The number of man-hours worked since that time has aggregated 335,846. In this industry, lost time on account of an injury means time lost after the day in which the man has been injured, which is somewhat different from the ordinary railroad practice. The 57 men in the car repair department make all kinds of light and heavy repairs to steel tank cars, including steel shell work, coupler and draft gear repairs and renewals, frame work, axle and wheel work, running board repairs and renewals, air brake work, painting and general maintenance and upkeep of all kinds. E. D. Murphey, safety engineer of the company, offers this record in the form of a challenge to the railways. Replies to this challenge may be addressed to the editor of this column.

How to Get Passengers Back on the Trains

Maybe this is the answer to the reliable old problem of how to recover lost passenger traffic. It was published recently in the Baltimore Evening Sun:

"The railroads of the country are complaining of the falling off in passenger traffic caused by the increasing popularity of the automobile. This constitutes a serious problem, yet the solution is self-evident. Obviously the railroads should do everything in their power to make travel on them resemble that in automobiles. Here are a few suggestions:

"For the benefit of the men, speedometers should be placed conspicuously in every car, so that passengers may see the speed at which the train is going. For the benefit of the women, communication should be provided between them and the engineer so that they can offer suggestions as to how he should drive.

"Trains should not be run on definite schedules. Passengers then could notify friends at their destination that they may be expected sometime between five and seven o'clock, provided nothing happens to delay them; but not to worry if they do not turn up by eight o'clock.

"Occasional freight trains should be permitted to bar the tracks for miles at a time and only unwillingly permit passenger trains to pass. They should pull over when another train is approaching in the opposite direction, so that the passenger train can escape a serious collision by the skin of its teeth.

"Passengers should be surrounded by baggage of all kinds, thus forcing them to sit in cramped and uncomfortable positions.

"In wet weather some arrangements should be made whereby a train would have the opportunity to skid and come up against a telegraph pole.

"All engineers driving at more than 40 miles an hour should be arrested on a charge of exceeding the speed limit. Stop-and-go lights should be placed every 500 yds. along the right-of-way.

"If, in addition to this, soft drinks and hot dogs supplanted the diners, and sleeping cars were replaced by tourist camps, the transformation would be complete. And who can say but that it might succeed?"

NEWS

Savings Banks Move to Protect R. R. Investment

Mutual banks for first time to undertake active role in aiding carriers

Mutual savings banks for the first time will undertake a direct part in settlement of the nation's railroad difficulties, it has been announced by Wilson G. Wing, president of the National Association of Mutual Savings Banks, whose depositors total 13,432,139. The banks of this organization hold about 15 per cent of rail bonds outstanding.

"The newly appointed committee on railroad investments, headed by Henry Bruere, president of the Bowery Savings Bank, New York, as chairman, has not been inaugurated with the idea of injecting a further controversial element into the complex rail investment situation," said Mr. Wing, "but rather as a body representing the mutual savings banks as a national group. The committee is charged with the responsibility of keeping closely in touch with railroad affairs, particularly with respect to the safeguarding of underlying bonds held by mutual savings banks.

"For many years our banks maintained a somewhat passive attitude toward controversial questions with respect to the rails, in which executives, representatives of labor, shippers, stockholders and sometimes the general public participated. But the very substantial investment in the soundest of rail issues, held by mutual savings banks has inspired the appointment of spokesmen for their interests, with the thought that their active participation in discussions which may arise will be helpful and constructive.

"At the moment there is no specific program with the exception of a compilation of statistics upon which to base studies and action, when it seems necessary and practical. Rails, as far as present-day indications evidence, will remain the backbone of our transportation system. They are as essential to our national economic life now as they were responsible for the development of this nation's resources in the early days. The extent to which they may be co-ordinated with other forms of transportation undoubtedly will receive attention. A properly balanced transportation system, with rails as the key, operating at highest efficiency, and with a reasonable opportunity to maintain themselves against competition at present subsidized by discrimination in taxation, is essential, and the ideal toward which progress should be directed.

"It is the desire and intent of the railroad investment committee to be constructive. The best interests of the railroads are identical with those of the holders of their underlying bonds. The viewpoint of a group of able men, representing in the aggregate a large investment in the soundest bonds of our railroads, should prove of decided value, and their active participation when such is deemed essential, will be found beneficial."

Besides Mr. Bruere the committee includes Robert C. Glazier, president, Society for Savings, Hartford, Conn.; S. Fred Strong, treasurer, Connecticut Savings Bank, New Haven, Conn.; Richard E. Goodwin, treasurer, Augusta Savings Bank, Augusta, Maine; James D. Garrett, president, Central Savings Bank, Baltimore, Md.; Myron F. Converse, president, Worcester Five Cents Savings Bank, Worcester, Mass.; Clifford F. Martin, treasurer, City Savings Bank, Pittsfield, Mass.; Thomas F. Wallace, president, Farmers & Mechanics Savings Bank, Minneapolis, Minn.; W. D. Vanderpool, president, Howard Savings Institution, Newark, N. J.; Philip A. Benson, president, Dime Savings Bank, Brooklyn, N. Y.; Walter H. Bennett, president, Emigrant Industrial Savings Bank, New York; Samuel H. Beach, president, Rome Savings Bank, Rome, N. Y.; Stacy B. Lloyd, vice-president, Philadelphia Saving Fund Society, Philadelphia, Pa. John W. Sandstedt is executive secretary of the association with headquarters at 347 Madison avenue, New York.

Electrical Associations To Hold Joint Meeting

The Electrical Section, Division IV, American Railway Association, and the Association of Railway Electrical Engineers, will hold concurrent meetings on October 27, at the Congress Hotel, Chicago. The two associations will meet on the same floor and it is expected that three or four committee reports will be presented at a joint session on the morning of that day.

Railroads Oppose Extension of Western Trunk Territory

Forty railroads are expected to oppose the Wyoming Public Service Commission in a hearing at Cheyenne, Wyo., on September 8 before the Interstate Commerce Commission on a proposal to include the entire state of Wyoming in the western trunk line territory. The purpose of the state commission's move is to obtain the benefit of lower freight rates than prevail in the Pacific area which embraces virtually the western two-thirds of the state.

Shippers Organize for Motor Truck Regulation

New Jersey commerce body sponsors nation-wide organization to secure legislation

Formation of the National Association for Motor Truck Regulation—an organization of shippers taking the position that "all the competitive transportation agencies should be permitted to flourish under fair and equal treatment"—is announced in a recent bulletin of the New Jersey State Chamber of Commerce. The new Association which the New Jersey State Chamber aided in creating is further described as an organization which represents "not the railroads, or the truckmen, but the shippers who produce the commerce that these two interests are competing to carry."

Ten states are represented on the board of directors of the National Association for Motor Truck Regulation and its officers include: President, Norman F. Titus, chairman of the special committee of the New Jersey State Chamber of Commerce which drafted the interstate motor vehicle regulatory bill which became H. R. 12,229 when introduced late in the last session in Congress and which is now being distributed for study before Congress reconvenes; vice-president, E. L. Hart, traffic manager, Atlanta Freight Bureau, Atlanta, Ga., S. P. Puffer, managing director, Chamber of Commerce, Charleston, W. Va., Charles E. Vose, industrial traffic manager, Boston, Mass., and William E. Rosenbaum, industrial traffic manager, St. Louis, Mo.; secretary, Milton P. Bauman, industrial traffic manager, Jersey City, N. J.; chairman of the board of directors, William Hildebrand, vice-president, Thomas A. Edison Industries, West Orange, N. J.

The bulletin announcing the formation of the Association discusses at some length the problem of the unregulated motor truck and tells members of the New Jersey State Chamber of Commerce that they "have much at stake in the settlement of this issue." It says in part:

"New Jersey has a special interest in this extremely controversial public question. The geographical position of the State between New York and Philadelphia, our own extensive terminal and export facilities, our modern motor traffic arteries, and the largest railroad mileage in proportion to area of any state, have induced competitive conditions on a scale unknown to any other part of the country.

(Continued on page 376)

Seven Months' Net Only 0.92 Per Cent

Gross revenues 28.3 per cent below those for corresponding period in 1931

Class I railroads for the first seven months of 1932 had a net railway operating income of $123,926,226 which was at the annual rate of return of 0.92 per cent on their property investment, according to reports compiled by the Bureau of Railway Economics. In the first seven months of 1931, their net railway operating income was $297,464,734, or 2.20 per cent.

Gross operating revenues for first seven months totaled $1,839,254,554, compared with $2,564,567,683 for the same period in 1931, or a decrease of 28.3 per cent. Operating expenses for seven months amounted to $1,472,358,701, compared with $1,996,802,643 for the same period one year ago, or a decrease of 26.3 per cent.

Class I railroads in the first seven months of 1932 paid $173,626,719 in taxes compared with $191,766,919 for the same period in 1931, or a decrease of 9.5 per cent. For July alone, the tax bill amounted to $24,424,635, a decrease of $3,941,545.

Seventy Class I railroads operated at a loss in the first seven months of 1932, of which 23 were in the Eastern district, 14 in the Southern and 33 in the Western district.

Class I railroads for July had a net of $11,596,851, at the rate of 0.49 per cent. In July, 1931, their net was $56,960,177, or 2.39 per cent.

Gross operating revenues for July amounted to $237,813,054, compared with $377,004,575 in July, 1931, a decrease of 36.9 per cent. Operating expenses in July totaled $191,751,529, compared with $280,072,510 in the same month in 1931, a decrease of 31.5 per cent.

Class I railroads in the Eastern district for seven months had a net of $103,323,854, at the rate of 1.54 per cent. For the same period in 1931, their net was $162,963,058 or 2.43 per cent. Gross operating revenues for the seven months totaled $952,333,522, a decrease of 25.9 per cent below the corresponding period the year before, while operating expenses totaled $730,865,450, a decrease of 26.6 per cent. Class I railroads in the Eastern district for July had a net of $9,755,950 compared with $24,762,689 in July, 1931.

Class I railroads in the Western district for seven months had a net of $14,115,600 at the rate of 0.29 per cent. For the same seven months in 1931, they had a net of $106,172,432, at the rate of 2.15 per cent. Gross operating revenues in the Western district for seven months amounted to $661,661,646, a decrease of 30.7 per cent, while operating expenses totaled $549,518,554, a decrease of 25.5 per cent. For July, the net in the Western district amounted to $3,057,890. The net of the same roads in July, 1931, totaled $29,366,156.

Class I railroads in the Southern district for the seven months had a net of $6,486,772, or 0.35 per cent. For the same period in 1931, their net amounted to $28,329,244, or 1.52 per cent. Gross operating revenues in the Southern district for seven months amounted to $225,259,386, a decrease of 30.5 per cent, while operating expenses totaled $191,974,697 a decrease of 27.1 per cent. Class I railroads in the Southern district for July had a net deficit of $1,216,989, compared with a net railway operating income of $2,831,332 in July, 1931.

CLASS I RAILROADS—UNITED STATES

	Month of July		
	1932	1931	Per cent Decline
Total operating revenues	$ 237,813,054	$ 377,004,575	36.9
Total operating expenses	191,751,529	280,072,510	31.5
Taxes	24,424,635	28,366,180	14.9
Net railway operating-income	11,596,851	56,960,177	79.6
Operating ratio—per cent	80.63	74.29	...
Rate of return on property investment	0.49%	2.39%	...
	Seven months ended July 31		
Total operating revenues	$1,839,254,554	$2,564,567,683	28.3
Total operating expenses	1,472,358,701	1,996,802,643	26.3
Taxes	173,626,719	191,766,919	9.5
Net railway operating-income	123,926,226	297,464,734	58.3
Operating ratio—per cent	80.05	77.86	...
Rate of return on property investment	0.92%	2.20%	...

Railroad Pay and Other Pay

There has been considerable wringing of hands, since it was disclosed to the Senate a while back that to some railway executives is paid more than fifty thousand dollars a year, and that heads of a few of the more important lines draw salaries touching, or nearly touching, six figures.

But these very hand wringers are undisturbed by the news that some one doing far less important work has just been "signed up" at a stipend that would make the salary of the most highly paid railroader look like a mere dole.

It is our idea that the business of running a transcontinental railroad is at least as important as the business of crooning over the radio, looking pretty in the movies, expert-ing at contract bridge, playing the outfield, managing a champion prize fighter, leading a night club orchestra, writing a syndicated newspaper column, drawing a comic strip, or knocking vaudeville audiences out of their seats.

The best practitioners in all these fields get more money than is paid to the ablest railroaders. And whether one has "been working on the railroad all the livelong day" for fifty thousand dollars a year, or managing an amusement enterprise for a million dollars a year, the money comes from the same source—the public's pocket. This present fuss about railway salaries is further evidence that a pressing need of today's America is recovery of the old sense of perspective.

—From an editorial in the Minneapolis (Minn.) Journal.

Tax Gatherer's Heavy Hand Felt by Railways

L. & N. attorney cites that road's payment of 73 per cent of this year's net

Opening with the statement that his company has felt "the heavy hand of the tax gatherer and has seen go for taxes $3,126,880, or, 73 per cent of its net operating revenue during the first seven months of this year," James J. Donohue, general claims attorney of the Louisville & Nashville, addressed the Lawrence County Taxpayers' League, at Lawrenceburg, Tenn., September 3.

Economy in municipal, county, state and federal government was advocated by Mr. Donohue, a cause, he said, "that must lie very close to the heart of everyone, because there can not possibly be any sustained prosperity for all our people," unless lawmakers are brought to a realizing sense of their duty in regard to governmental extravagance.

After discussing generally tax matters in local government, the speaker dwelt on "the waste of Federal funds." He pointed out that Federal expenditures increased 63 per cent, or $1,231,000,000 in the fiscal year 1931, over the fiscal year 1927 and 32 per cent over the 1929 fiscal year. "Is it any wonder that the Government was running behind to the extent of two and one-half billion dollars a year, and that short-term notes had to be resorted to in order that ordinary expenses might be met?" he asked.

"To the extent of $202,000,000, the Post Office Department accounts for a part of the Government deficit," the speaker said, "and of this amount second-class mail matter is chargeable with $97,000,000; parcel post, $21,000,000; air mail, $11,000,000; and franked mail, including speeches by Congressmen and Senators, $8,000,000. A congressional committee, headed by Congressman Joseph B. Shannon of Missouri, is now investigating the question of the waste of federal funds by the incursion of the United States Government into private business, and at a hearing held at South Bend, Ind., on August 22, E. L. Oliver, representing the Brotherhood of Railway & Steamship Clerks, protested, on behalf of his organization, the parcel post subsidy of more than twenty million dollars a year, and called attention to the fact that the operation of the parcel post at less than cost was a direct violation of the parcel post act of 1912." (See *Railway Age* of September 3, page 342.)

Speaking of the cost of federal bureaus, Mr. Donohue said, "Expenditures for all major departments, commissions, bureaus, etc., of the government in the fiscal year 1927, according to the latest annual report of the Secretary of the Treasury, were $1,964,000,000, and by 1932 they had increased to an estimated cost of $3,195,100,000, or 63 per cent." He said that it has been estimated that one out of eleven persons gainfully employed in this country is on the payroll of the federal, state, or local government. The bureau of valua-

tion of the Interstate Commerce Commission in the seventeen years since its creation has cost the railroads $140,000,000 and the government $40,000,000, he said, adding that while the job of valuing railroad property is not yet complete, the commission has already found that the value of railroad property is more than two billion dollars in excess of the aggregate par value of all the railroad stocks and bonds now outstanding.

Quoting a witness in the Shannon Committee hearings, Mr. Donohue said that at the present time the Government is actually engaged in some one hundred and fifty different lines of business, depriving grocers, butchers, caterers, merchandise dealers of all sorts of trade they might enjoy. "Like any other industry," he said, "the railroads have a just cause of complaint against this particular governmental policy, for the reason that subsidized competition has cut cruelly into their revenues, and taxes paid by them are in part used to support these competitors. To June 30, last year, $770,000,000 was spent by the Government to canalize rivers and to keep clear for navigation these channels; and for the fiscal year 1931, for the same purpose $60,000,000 was appropriated. These expenditures are made on the theory that additional transportation facilities are needed for the expeditious handling of the country's commerce, but, in reality, that a few shippers having river-bank industries may enjoy freight rates lower than those available to their competitors not so favorably located."

Mr. Donohue asserted that water transport is probably more menacing to railroads than is any other form of subsidized competition. He said buses and trucks can, and doubtless will, be adequately regulated and it is probable that withdrawal of the subsidy now being given airplanes will not long be deferred, but those who are favored with cheap river rates are so firmly entrenched at Washington and are so active in their home districts that only a campaign of education will end what is to all intents and purposes a "racket." He warned against the Shipstead Bill which would add another $500,000,000 to be raised by taxation and do but little toward relieving unemployment.

Mr. Donohue concluded by appealing to the taxpayers to request congressmen to put an end to expenditures for the creation of additional transportation facilities at the expense of the railroads.

Commissioner Meyer Locates the Responsibility

Railway stockholders who may believe that salaries of railway officers are too high have a remedy in their own hands, if enough of them think alike on the subject, according to a letter recently sent by Commissioner B. H. Meyer of the Interstate Commerce Commission in reply to one by a stockholder who had asked the commission to do something about "exorbitant" salaries. Commissioner Meyer in his reply pointed out that the commission has no direct supervision over salaries paid by railways but that it had recently collected information on the subject which had been made public. "If, as you say," he added, "millions of stockholders feel as you do that railway salaries are improper, they should exercise their rights as stockholders over the managements of the companies in order to bring about such changes as will result in a basis considered proper by them."

Fire Destroys Grand Canyon Lodge

The Union Pacific lodge, together with two cabins located on the north river of the Grand Canyon in Arizona was destroyed by fire on September 1, the estimated damage being $2,000,000.

Eleven Cars of Silk

A shipment of 4,000 bales of raw silk left Seattle, Wash., in 11 cars, on August 30 over the Chicago, Milwaukee, St. Paul & Pacific for Chicago, where it arrived on September 1. It was turned over to the Michigan Central for transportation to New York. The silk is valued at $1,440,000.

Vehicle Container Tariff Suspended

The Interstate Commerce Commission has suspended from September 1 until April 1, 1933, the operation of tariff schedules published by the St. Louis Southwestern which propose to establish rates on vehicle containers loaded or empty, such as motor trucks, trailers, truck or trailer bodies, between St. Louis, Mo., and points in Arkansas and Louisiana.

Moffat Tunnel Bonds

The final brief in the Moffat tunnel bond litigation over the validity of $8,750,000 supplemental bonds was filed in the Colorado Supreme Court on September 1 by attorneys representing the Denver Land Company. After oral arguments, the court will take the case under advisement and decide whether the supplemental bonds are legal.

Loans to Railways

Loans to railways from the Reconstruction Finance Corporation approved by the Interstate Commerce Commission during the month of August amounted to $58,406,449, which brought the total of such loans approved by the commission up to $305,917,457. The total amount of the applications filed, as revised, amounts to $407,385,463.

Roads Meet to Choose "Czar"

A committee of western railroad presidents met in Chicago on September 7, 8 and 9 to discuss the selection of a commissioner to control the competitive activities of the western lines. The final choice of a commissioner will lie with the heads of the roads, who will vote for one of a small group of men recommended. Sponsors of the plan maintained secrecy as to the men under consideration with the idea of avoiding forced selection.

Bargain Fares Bring Business to Southern and N. & W.

More than 100,000 passengers, including many who had never been on a train before and others who had never seen the inside of a sleeping car, were handled by the Southern at its "Train Travel Bargain Fare" rates during July and August. Since the fact that these people took a trip on a train was known to their families and probably to several friends it is estimated that possibly 500,000 or more persons had the Southern's passenger service brought to their attention during the two months. Also, aside from this merchandising factor from which the road expects to gain substantially in the future, the immediate revenues from the July and August excursion business were considered most satisfactory.

On the Norfolk & Western, the current issue of the Norfolk & Western Magazine says, thousands of people have taken advantage of the low fare excursions operated by that road during July and August. One N. & W. excursion attracted 2,500 passengers while others were patronized by crowds of from 600 to 1,000.

Labor Day Excursions

More passengers and approximately the same revenue as compared with last year characterized the Labor Day excursions this year. The rates in effect in the western territory were approximately one cent a mile in coaches and two cents a mile in sleeping cars, while at the same time special rates were established between stated points. The Illinois Central sold between 7,000 and 10,000 tickets at reduced rates and in addition operated a special train from Chicago to New Orleans, La., another from Memphis, Tenn., to New Orleans, and a third from Memphis to Chicago, with the respective round trip fares of $20.26, $4, and $11.75. The Chicago & North Western reported a 26 per cent increase in revenue this year as compared with last year. A total of 2,549 passengers were carried to Lake Geneva, Wis., and three extra sections were operated to the north woods in Wisconsin. Three special trains, one each on Monday, Wednesday and Thursday, carried 525 passengers to the American Legion convention in Portland, Ore. The Chicago, Rock Island & Pacific handled 3,500 persons out of Chicago, an increase of 10 per cent over the Labor Day movement last year.

Injunction to Protect Roundhouse Water Supply

The Mobile & Ohio has obtained from United States Judge Wham at East St. Louis, Ill., a temporary order restraining the Illinois Department of Purchases and Construction from completing the Cache River drainage canal in Alexander county, Illinois, contending that the canal will divert the water now used for its locomotive roundhouse at Tamms, Ill. The Mobile & Ohio has operated a pumping station at Tamms for more than 30 years. This station is located on the Cache river at a point below the junction with the proposed canal, which has been completed with the exception of about 80 ft. needed to connect it with the Cache river. The railroad obtains water from the river for use in cleaning locomotives and for other purposes and contends that if the canal is completed, the Cache river will cease to flow past Tamms except in flood times and that the pumping station, constructed at a cost of $14,000, will become useless. It also contends that the roundhouse will

be forced to obtain water from deep wells which would not provide adequate supply without expensive construction work. In addition, the sinking of wells may prove unsuccessful.

I.C.C. Denies Blanket Authority to Reduce Rates on Short Notice

The Interstate Commerce Commission, by Division 2, has denied the sixth section application filed by F. L. Speiden, tariff-publishing agent for the southern carriers, on behalf of the railroads generally, for a general continuing authorization to the railways to publish and file with the commission tariffs and supplements, effective on one day's notice, establishing reduced rates to meet motor truck competition. The commission's order said the application was denied because of "no such showing of special or unusual conditions being made as would warrant the commission in granting the exemption desired." The amended application filed by Mr. Speiden was concurred in by F. W. Gomph, Frank Van Ummersen, H. G. Toll, B. T. Jones, J. E. Johanson, and E. B. Boyd, tariff-publishing agents representing carriers in various sections.

Commissioner Aitchison had pointed out in a recent address that in the year ending October 31, 1931, 8,287 applications were made to the commission for authority to change rates upon less than the statutory 30 days' notice, and that the authority was granted in 7,091 instances, while 767 were denied, the remainder being otherwise concluded.

Club Meetings

The Car Men's Association of Chicago will hold its next meeting at the Auditorium Hotel, Chicago, on Monday evening, September 12. Joe Marshall, American Railway Association, will present a paper on loss and damage claims.

The Cincinnati (Ohio) Railway Club will hold its next meeting on Tuesday evening, September 13, at Hotel Gibson. The speaker will be Samuel O. Dunn, chairman of the Simmons-Boardman Publishing Company. There will be the usual dinner party and musical entertainment.

The Southern and Southwestern Railway Club will hold its annual outing at the East Lake Country Club, Atlanta, Ga., on Thursday, September 15.

The New York Railroad Club will hold its first 1932 Fall meeting on Friday evening, September 16, in the auditorium of the Engineering Societies building, 29 West Thirty-ninth street, New York. Alford J. Williams, formerly lieutenant, United States Navy, assigned to special aeronautical duties, will speak on "The Practical Part that Our Railroads Could Play in Air Transportation." Lieut. Williams' talk will be followed by a program of motion pictures.

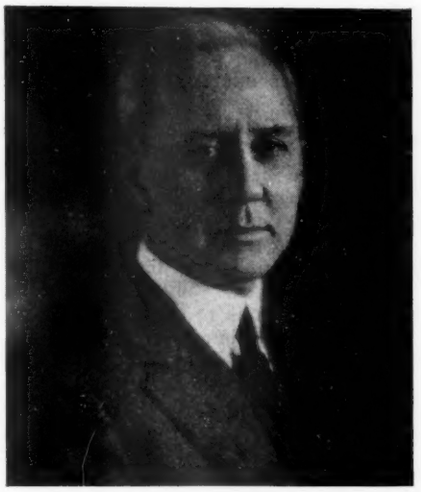
The Northwestern Car Men's Association (St. Paul) will hold its next meeting on Monday evening, September 19, at the Minnesota Transfer Y. M. C. A. Building. G. J. Conklin, Soo Line, will speak on the A.R.A. loading rules, and on supplement No. 2 to the Interchange Rules.

The Indianapolis (Indiana) Car Inspectors' Association will hold its next meeting at Hotel Severin, Indianapolis, on Monday evening, October 3. Arthur I. Franklin will speak on "Earning Ability—Your Most Valuable Asset."

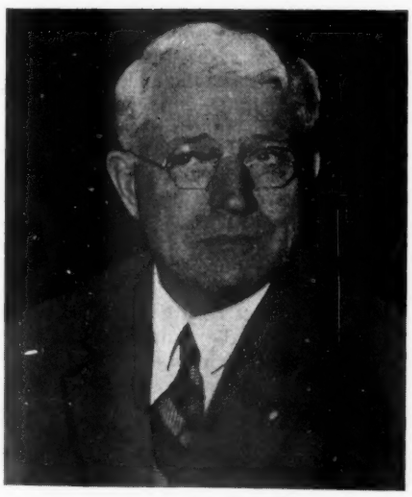
Whitney Succeeds Robertson as Head of Labor Executives

Alexander F. Whitney, president of the Brotherhood of Railroad Trainmen, with headquarters in Cleveland, Ohio, was elected to succeed David B. Robertson as chairman of the Railway Labor Executives' Association at a meeting of that association held in Cleveland on Wednesday, August 24. Mr. Robertson, who has been president of the Brotherhood of Locomotive Firemen and Enginemen since 1922 and chairman of the labor executives' group since its formation, resigned from the latter position at his own request in order to devote more time to his other duties. He will continue as president of the B. L. F. & E. and as an active member of the executives' association.

David B. Robertson was born at West Austintown, Ohio, on May 13, 1876, and was educated in public and correspondence schools. In 1895, after a varied working experience in several industries, he entered railroad service as an engine wiper on the Pennsylvania. From 1898 to 1913 he served successively as hostler, fireman and engineman on the Erie. It was with this company that he first became officially connected with the Brotherhood of Locomotive Firemen and Enginemen, serving as general chairman for the Erie System from 1905 to 1913. In the latter year he was elected vice-president, and in July, 1922, president of the national union, with headquarters in Cleveland. Both in his capacity as president of the B. L. F. & E. and as chairman of the Railway Labor Executives' Association, Mr. Robertson has taken an active part in various negotiations between railway labor and railway managements, and was largely responsible for the amicable and successful settlement, early this year, of negotiations leading to a general 10 per cent reduction in wages.



David B. Robertson



Alexander F. Whitney

Alexander F. Whitney was born at Cedar Falls, Iowa, on April 12, 1873, and was educated in public and high schools at Cherokee, Iowa. He entered railway employ as a brakeman on the Illinois Central in 1890, subsequently serving in the same capacity on the Fremont, Elkhorn & Missouri Valley (now part of the Chicago & North Western) on the Union Pacific, and on the C. & N. W., on which road he was also a conductor. He joined the Brotherhood of Railroad Trainmen as a member of G. E. Boynton Lodge No. 138, Eagle Grove, Iowa, acting for several years as master of that lodge and chairman of its local grievance committee. He was later elected chairman of the B. R. T. general grievance committee, Chicago & North Western, serving in that capacity until 1907. In 1905 he had been elected a member of the board of grand trustees, B. R. T., and in 1907 he was elected vice-president of that organization, which he has also served as general secretary and treasurer. In 1928 he was elected president of the Brotherhood of Railroad Trainmen, which position he will retain in addition to his new duties as chairman of the Railway Labor Executives' Association.

Railroad Credit Corporation Loans

The Railroad Credit Corporation on September 1, had either actually made or had authorized loans to railroads to meet their fixed interest obligations totaling $30,937,199, according to the monthly report of that corporation filed with the Interstate Commerce Commission. Collection of rate increases under Ex Parte 103, according to the report, totaled $31,075,145.36 in the first six months this year, the increase having become effective January 4. The amount derived from the increase amounted to $5,040,935.36 in June.

In a letter addressed to chief executives of participating carriers and accompanying the report, E. G. Buckland, president of The Railroad Credit Corporation, said:

"Fifty-four participating carriers have applied for loans aggregating $89,076,457. Of this amount $52,002,782 has been withdrawn from the docket as representing requests beyond the scope of the Plan or funds which could be secured from other sources. The remaining $37,073,675 is divided between approved loans of $30,937,199 and deferred items of $6,136,476. Loans made have aggregated $26,647,959 and payments $1,065,250, leaving the net

outstanding as per balance sheet of $25,582,709.

"In the first few months following organization, the Credit Corporation was without funds and its assistance to applicant carriers was limited to commitments that were to be taken up as fast as receipts warranted. As a result of this situation and in furtherance of the carefully prepared program, the Reconstruction Finance Corporation advanced against the Credit Corporation's commitments, $16,064,942.50. It is gratifying to report that the present outstanding commitments of $4,289,240 include but $2,170,500 of such Reconstruction Finance Corporation temporary loans."

Minnesota "Ship by Rail" Club

A state and nation-wide drive to stop the spending of taxpayers' money for subsidies to waterways and commercial highway traffic, and to bring all forms of transportation under equal regulation, will be launched at a public mass meeting at St. Paul, Minn., on September 16, sponsored by the railway employees of Minnesota who find themselves out of jobs or their employment imperiled largely as a result of traffic being diverted from the railways by what they claim is unfair competition. In normal times the railways employ about 40,000 persons in Minnesota.

Prominent speakers will discuss the problems resulting from the competition between the railways, motor trucks and buses, barge lines and coastal steamers. The meeting will follow a convention earlier in the day at which delegates from 65 "Ship by Rail" clubs in various parts of the state will form a state organization to co-relate the work of the smaller units and to expand the movement to national scope.

The principal speaker at the public meeting will be Samuel O. Dunn, chairman of the board of the Simmons-Boardman Publishing Company and editor of the *Railway Age,* who will speak on the public's interest in restoring equality of competitive opportunity among the various forms of transportation. The viewpoint of the farmers will be presented by R. W. Keeler, treasurer of the Livestock Shippers' association. Shippers will be represented on the program by Paul Scheuemann of the Northwest Shippers' Protective association.

An educational campaign and "organizing of political strength" will be the immediate objectives of the state body, according to Joseph J. Brown, chairman of the advisory board of the temporary organization formed a few weeks ago.

"The railway managements," according to Mr. Brown, "have had and are having no part in this organization. It is a natural development of the interests of railway workers. About six years ago a number of 'Ship by Rail' clubs were organized by employees in various towns where railway men were being thrown out of work on account of the curtailment of train service resulting from the loss of traffic to the highways. More recently it has been recognized that the problems with which these local groups sought to deal were of state and national scope and to be met effectively would require state and national organizations. At a meeting in St. Paul in July a temporary state organization was effected which now has a membership of 16,000, while the number of local clubs has increased to 65."

W. T. Hullinger is chairman of the temporary organization, which maintains offices in the Globe Building, St. Paul.

Shippers Organize for Motor Truck Regulation

(Continued from page 372)

"This special interest prompted the New Jersey State Chamber of Commerce to make an effort to hasten some degree of regulation of interstate motor vehicle common carriers through the reconciliation of conflicting legislative proposals and an agreement on fair, essential principles. The effort was crystallized in the bill presented in the House by Congressman Percy Stewart of the Fifth New Jersey district. The bill has been printed as H. R. 12,229 and is being distributed for study and discussion before the Congress reconvenes in December.

"Realizing that orderly consideration of so important a question is imperative to a just conclusion, the State Chamber has since aided in the creation of the National Association For Motor Truck Regulation—and this association represents not the railroads, or the truckmen, but the shippers who produce the commerce that these two interests are competing to carry.

"Senator Couzens, who introduced S 2793 on which public hearings in Washington were held last winter, described these hearings as purely selfish contests between the railroad and the truck. He said that his committee 'did not feel like taking any action until the public interest was expressed.' The purpose of the new association is to determine and express this public interest.

"Motor trucking interests have opposed Federal regulation at hearings in Washington with the plea that 'motor truck regulation first should be sponsored by the individual states.' At hearings before the State Legislature they have put forth the claim that 'Federal legislation should be established first, after which state legislation might then be patterned.'

"Shippers have a substantial interest in motor truck regulation. An increasing number of them realize that the trend in transportation is chaotic and that, if it is allowed to continue, it is very likely to result in the breakdown of our transportation arteries. One group of shippers maintains that it is manifestly unfair to regulate the railroads and to allow their competition to remain unregulated.

"Another group, comprising manufacturers and producers,—the sugar, cement, fertilizer and the lumber industries,—is experiencing substantial losses, due to failure to ascertain the transportation costs of their competitors because charges of motor truck transporters are not published in the same manner as are rates and charges of the railroads. These and other industries are unable to determine their proper transportation costs.

"Communities dependent upon railroad taxes find themselves faced with bankruptcy because of the inroads on railroad revenues made by wasteful motor truck competition, so much so that these important railroad ratables may soon disappear. At the same time much of the cost of construction and maintenance of highways is being assessed against real and personal property, rather than against users and beneficiaries of the highways.

"There is no thought on the part of the new association to stop the wheels of progress. It has at the start taken the position that all of the competitive transportation agencies should be permitted to flourish under fair and equal treatment. The regulation that it will advocate, therefore, will be consistent with this point of view. It has already stated its purpose to protect the railroads against unfair competition, and with equal vigor oppose burdensome and unreasonable regulation of motor transportation.

"The association comprises a membership scattered throughout the territory east of the Mississippi River. It will have representatives in each state, who will further its objectives."

Passenger-Automobile Rates Reduced

The Chicago & Eastern Illinois has reduced combination passenger-automobile rates approximately 20 per cent. Heretofore, this railroad had in effect from various points along its lines to Florida and other southern points, a rate which provided for the carrying of one automobile and two passengers on the purchase of five tickets. This rate is to be reduced to the price of four tickets for one car and two passengers. The new rate applies on all trains to all points, including the Dixie Flyer and Dixie Express to Florida and the South, and other trains from Chicago to New Orleans and the Gulf Coast.

Association of Inland Waterway Carriers Proposed To Combat Railway Rate-Cutting

A recommendation that the government Inland Waterways Corporation join with independent boat lines in the formation of an association "for the advancement and protection of mutual interests," particularly such interests as are involved in competition with the railways, was made in a resolution adopted by the advisory board of the waterways corporation on September 2, before Secretary of War Hurley heard about it. The plan is understood to have been advanced by General T. Q. Ashburn, executive of the corporation, last year, and was to have been put into effect by him if the Secretary of War approved. This Secretary Hurley has not done to date and as soon as he heard of it he ordered the press announcement of the recommendation "killed," but slightly too late to prevent its being carried over press association wires and widely published.

The press statement referred to the recommendation as having been adopted "in view of representations made by A. P. Calhoun, vice-president of the American Barge Line Company," and added that the idea for the formation of such an association was advanced by General Ashburn in April, 1931, "and was not altogether favorably received at that time." However, according to the statement, the view was expressed to the board by Mr. Cal-

houn that "in view of later developments, and the persistent effort by the railroads to destroy independent operations through constant reduction of railroad rates beyond 'reasonably compensatory' rates, it became imperatively necessary to organize the association suggested by General Ashburn the preceding year, as without the aid of the Inland Waterways Corporation, the greatest and most powerful inland waterway transportation agency in the United States, little could be accomplished through independent action." Mr. Calhoun was stated to have expressed the thought that a very large percentage of water carriers, common, contract, and private, were exceedingly anxious for the Federal Barge Line to take the initiative in forming such an association.

Some of the barge line interests have been greatly exercised over the reduced rates on cotton on a carload basis recently proposed by the southwestern railways, which the Interstate Commerce Commission after a lengthy conference of interested parties allowed to become effective without suspension, because some of the new rail rates, provided cars are loaded to 65,000 pounds, are almost as low as the barge-load rates proposed last October by the Federal Barge Line which were continued by independent lines after the rates of the government barge line had been suspended by order of the War Department. The Inland Waterways Corporation thus far has announced no intention of cutting its own port-to-port rates to meet the rate of 25 cents per hundred pounds put into effect by the railways from Memphis to New Orleans, but its traffic department has been negotiating with the railways for a basis of joint rail-barge rates to compete with truck-barge rates.

Six Months' Deficit $127,384,204

Class I railways in the first six months of this year failed to earn their fixed charges by $127,384,204, according to the Interstate Commerce Commission's monthly compilation of selected income and balance-sheet items. In the corresponding period of last year they had a net income of $31,143,329. For the month of June the net deficit was $20,722,700, as compared with a net income of $21,414,543 in June, 1931. For the six months period the roads had a net railway operating income of $113,128,233 and other income amounting to $104,541,954 but deductions amounted to $345,054,391. Dividend declarations from income and surplus for the first six months of this year amounted to $51,294,665, as compared with $188,212,841 in the corresponding period of last year.

SELECTED INCOME AND BALANCE-SHEET ITEMS OF CLASS I STEAM RAILWAYS IN THE UNITED STATES

Compiled from 160 reports representing 164 steam railways, including 17 switching and terminal companies

TOTALS FOR THE UNITED STATES (ALL REGIONS) †

For the month of June		Income Items	For the six months of	
1932	1931		1932	1931
$12,775,812	$50,874,796	1. Net railway operating income	$113,128,233	$241,487,455
24,308,641	28,557,563	2. Other income	104,541,954	133,285,589
37,084,453	79,432,359	3. Total income	217,670,187	374,773,044
11,047,170	11,200,006	4. Rent for leased roads	65,718,957	65,849,504
44,675,777	44,498,157	5. Interest deductions	266,553,083	264,986,050
2,084,206	2,319,653	6. Other deductions	12,782,351	12,794,161
57,807,153	58,017,816	7. Total deductions	345,054,391	343,629,715
d 20,722,700	21,414,543	8. Net income	*d 127,384,204*	31,143,329
		9. Dividend declarations (from income and surplus):		
9,192,475	46,861,465	9-01. On common stock	41,572,068	154,528,664
3,398,617	15,445,318	9-02. On preferred stock	9,722,597	33,684,177

BALANCE-SHEET ITEMS

Selected Asset Items	Balance at end of June 1932	1931
10. Investments in stocks, bonds, etc., other than those of affiliated companies (Total, Account 707)	$774,782,892	$843,063,933
11. Cash	279,582,971	388,938,862
12. Demand loans and deposits	39,021,551	52,181,941
13. Time drafts and deposits	18,342,712	85,419,585
14. Special deposits	50,364,848	66,944,954
15. Loans and bills receivable	13,465,255	9,595,005
16. Traffic and car-service balances receivable	46,899,194	70,232,717
17. Net balance receivable from agents and conductors	35,910,154	53,178,941
18. Miscellaneous accounts receivable	154,834,752	173,997,425
19. Materials and supplies	350,765,087	412,790,346
20. Interest and dividends receivable	33,559,192	34,797,850
21. Rents receivable	2,052,863	3,136,783
22. Other current assets	6,538,258	11,592,789
23. Total current assets (Items 11 to 22)	1,031,336,837	1,362,807,198
SELECTED LIABILITY ITEMS		
24. Funded debt maturing within six months *	78,610,246	67,504,443
25. Loans and bills payable	262,974,448	178,482,711
26. Traffic and car-service balances payable	64,927,686	97,501,195
27. Audited accounts and wages payable	217,074,428	294,949,764
28. Miscellaneous accounts payable	75,989,377	77,117,215
29. Interest matured unpaid	187,411,600	*a* 202,070,743
30. Dividends matured unpaid	13,550,496	28,101,960
31. Funded debt matured unpaid	49,929,647	50,987,018
32. Unmatured dividends declared	5,216,447	48,921,323
33. Unmatured interest accrued	94,724,849	95,928,457
34. Unmatured rents accrued	19,944,123	20,092,685
35. Other current liabilities	21,813,234	27,143,117
36. Total current liabilities (Items 25 to 35)	1,013,556,335	1,121,296,188

† Complete data for the following Class I railways not available for inclusion in these totals: Canadian National Lines in New England, Canadian Pacific Lines in Maine, and Canadian Pacific Lines in Vermont.

* Includes payments which will become due on account of principal of long-term debt (other than that in Account 764. Funded debt matured unpaid) within six months after close of month of report.

a Includes $29,502,795 unpaid interest accrued by Chicago & Alton R. R., succeeded by The Alton R. R. as of July 19, 1931.

d Deficit.

Equipment and Supplies

LOCOMOTIVES

THE READING COMPANY will start work in September, reconditioning 78 locomotives. (See item under Miscellaneous.)

THE UNION OF SOVIET SOCIALIST REPUBLICS is inquiring for 36 locomotives; these include seven of the 0-10-0 type, five 0-8-0 type, twenty 0-6-0 type and four 0-4-0 type.

THE UNITED STATES NAVY DEPARTMENT, BUREAU OF SUPPLIES AND ACCOUNTS, is inquiring for a 45-ton gas-electric switching locomotive for the naval air station at Sunnyvale, Cal.

BALTIMORE & OHIO.—The directors have authorized President Daniel Willard to arrange for a loan of $3,000,000 on terms outlined by the Reconstruction Finance Corporation. The money is to be used for heavy repairs to 150 locomotives and 2,500 freight cars and for completing the construction of 1,000 new freight cars which had been started some time ago but work on which had been stopped before completion.

FREIGHT CARS

BALTIMORE & OHIO.—See item under Locomotives.

THE MONSANTO CHEMICAL WORKS contemplates buying six tank cars of 7,000 gal. capacity.

THE PACIFIC FRUIT EXPRESS is inquiring for 240 tons of structural steel for car underframes which it will fabricate in its shops at Roseville, Cal.

THE READING COMPANY will start work in September making heavy repairs to 3,000 cars and light repairs to 800 cars. (See item under Miscellaneous.)

IRON & STEEL

THE ERIE has placed an order with the Jones & Laughlin Steel Corporation for steel, involving about 400 tons, for a bridge at Erwins, N. Y.

THE GRAND TRUNK WESTERN has ordered 150 tons of structural steel for grade crossing elimination work at Detroit, Mich., from the American Bridge Company.

SIGNALING

MISSOURI PACIFIC.—On petition filed by this company to be relieved of the requirements of the Interstate Commerce Commission's automatic train-control orders, the commission has re-opened the matter for further hearing to permit the company to submit evidence in support of its petition.

MISCELLANEOUS

THE NEW YORK CENTRAL has ordered a large number of locomotive valve pilots from the Valve Pilot Corporation.

Many Shops Re-open

Several railroad shops in the western territory were re-opened during the first part of September, giving employment to several thousand men. The Union Pacific shops at Junction City, Kan., were re-opened on September 1, giving employment to 60 men five days a week. The Aurora shops of the Chicago, Burlington & Quincy, which have been shut down since July 31, were re-opened on September 6 with a re-employment of 550 men. Five hundred employees of the locomotive shops of the St. Louis Southwestern at Pine Bluff, Ark., returned to work on September 7 after a two-months layoff. The Illinois Central, during September, will increase its maintenance of way program by adding men to its forces and increasing the hours of men now working. This will be equivalent to placing approximately 1,000 men on full time.

Reading Company Recalls Over 2,000 Men to Its Shops

The Reading Company, according to a statement of President Charles H. Ewing, will recall more than 2,000 employees to its locomotive and car repair shops in September and due to the gradual improvement in business conditions the road will make extensive repairs to equipment. Additional employment will be provided this week for 710 men in its locomotive and car shops at Reading, Pa., and in its car repair shops at St. Clair. At these points light repairs will be made to 800 cars. During September the management expects to begin heavy repairs to 3,000 cars mostly at the shops at Reading, and 78 locomotives also will be reconditioned. This work will place in service an additional 734 men in the locomotive shops and 645 in the car shops. The total work involves an expenditure of more than $1,200,000 and will give employment to 2,100 men over a period of several months.

Supply Trade

John B. Foley, Jr., 510 Hills building, Syracuse, N. Y., has been appointed representative in that district for the **Coppus Engineering Corporation,** Worcester, Mass.

Louis E. Underwood, managing engineer of the stationary motor engineering department of the **General Electric Company** at Lynn, Mass., has been appointed manager of the Pittsfield, Mass., works of the company to succeed **E. A. Wagner,** who has retired.

Walker H. Evans, formerly connected with the sales department of the **Standard Steel Works Company** district office at Chicago, has been transferred and appointed district manager of the Philadelphia, Pa., office. **Howard J. Snowden,** formerly of the Philadelphia office, has been transferred to the Chicago office.

OBITUARY

Fred N. Baylies, who resigned as vice-president of the P. & M. Company, Chicago, with headquarters in New York, in 1928, died in Hollywood, Cal., on September 2, following a heart attack. He entered the employ of the P. & M. Company in 1915 as representative at New York and was later appointed vice-president, which position he held until his retirement. Prior to 1915 he was a sales representative of the Aluminum Company of America.

Construction

ATCHISON, TOPEKA & SANTA FE.—A contract has been awarded to the G. Allen Construction Company, Los Angeles, Cal., for the construction of an extension to this company's freight house at Oklahoma City, Okla., to accommodate a heating plant, and for the remodeling of the freight house.

CHESAPEAKE & OHIO.—This company has authorized the construction, at an estimated cost of approximately $44,300, of a track connection to the new Cincinnati (Ohio) Union Terminal; and has also given authority for the construction of an overhead highway bridge across its tracks at Barboursville, W. Va. Work in connection with the latter project will be handled by the West Virginia State Road Commission, the railway company's proportion of the cost amounting to $20,000.

CHICAGO, ROCK ISLAND & PACIFIC—MISSOURI-KANSAS-TEXAS—ST. LOUIS SOUTHWESTERN.—A contract has been awarded to W. H. Nichols & Co., Inc., Dallas, Tex., for the construction of a subway to carry the combined Lamar and McKinney streets under 12 tracks of these companies in that city, at a cost of $149,921. The cost of this project is being shared jointly by the three railroads and the city.

RICHMOND, FREDERICKSBURG & POTOMAC.—A contract for the construction of an underpass under this company's tracks at Lombardy street, Richmond, Va., has been awarded to the City Building Corporation, Richmond. The city of Richmond is to pay 25 per cent of the cost of the project, which is estimated at $65,000 or $75,000.

TERMINAL RAILROAD ASSOCIATION OF ST. LOUIS.—The city of St. Louis, Mo., plans to apply to the Reconstruction Finance Corporation for a loan of $1,500,000 to help finance the construction of additional railroad approaches to the St. Louis municipal bridge across the Mississippi river. The Terminal Railroad Association has already advanced the city $1,500,000, or one-half the estimated cost of the five approaches necessary to permit full use of the bridge by the railroads that are members of the association, but has requested that further advances be deferred until business improves.

Financial

BALTIMORE & OHIO.—*Bonds.*—The Interstate Commerce Commission has authorized this company to procure the authentication and delivery of $31,625,000 of refunding and general mortgage bonds, series E, and to issue a like amount of such bonds, series F—all to be used in retiring $63,250,000 of 20-year 4½ per cent convertible bonds maturing March 1, 1933.

ILLINOIS TERMINAL.—*Recapture Report.*—The Interstate Commerce Commission has issued a recapture report finding that this company in the years 1920 to 1924 earned $1,350,899 in excess of 6 per cent on its valuation, of which one-half is recapturable.

MURFREESBORO-NASHVILLE.—*Acquisition.*—This company has applied to the Interstate Commerce Commission for authority to acquire and operate the property of the Murfreesboro-Nashville Southwestern, which has a line from Murfreesboro to Nashville, Ark., 14 miles, and to issue 160 shares of stock and $30,000 of bonds.

NEW YORK, CHICAGO & ST. LOUIS.—*Notes.*—This company has applied to the Interstate Commerce Commission for authority to issue new or extended five-year promissory notes for $20,000,000, to be dated October 1, at not exceeding 6 per cent interest, to be delivered as payment or in exchange for a like amount of three-year 6 per cent notes which mature on that date. In asking for a loan from the Reconstruction Finance Corporation the company had stated that if it could not obtain the full amount it would like to have half the amount so that holders of the notes could be offered 50 per cent in cash and 50 per cent in new notes.

PENNSYLVANIA.—*Securities.*—The Interstate Commerce Commission has authorized the Northern Central to issue $1,200,000 of general and refunding mortgage 5 per cent bonds and $4,356,000 of capital stock to be delivered to the Pennsylvania, lessee, in payment for capital expenditures.

ST. LOUIS, BROWNSVILLE & MEXICO.—*Abandonment.*—This company has applied to the Interstate Commerce Commission for authority to abandon its lines from Seadrift, Tex., to Port O'Connor, 16.07 miles, and from Buckeye to Collegeport, 16.9 miles.

SOUTHERN.—*R.F.C. Loan.*—The Interstate Commerce Commission has issued a supplemental report amending the conditions as to collateral imposed in the report in which it recently authorized a loan of $7,251,000 to this company so that it may substitute for $323,000 of common stock of the Southwestern Construction Company equipment trust certificates in the amount of $246,000 and $2,000,000 par value of stock of the Virginia & Southwestern.

WOODSTOCK.—*Abandonment.*—This company has applied to the Interstate Commerce Commission for authority to aban-

don its entire line from White River Junction, Vt., to Woodstock, 13.69 miles.

Dividends Declared

Beech Creek.—50c, quarterly, payable October 1 to holders of record September 16.

Carolina, Clinchfield & Ohio.—1 per cent, quarterly, payable October 10 to holders of record September 30; Stamped Certificates, 1¼ per cent, quarterly, payable October 10 to holders of record September 10.

Cincinnati Union Terminal.—5 Per Cent Preferred, 1¼ per cent, quarterly, payable October 1 to holders of record September 19.

Dayton & Michigan.—Preferred, 2 Per cent, Common, 1¾ per cent, semi-annually, both payable October 1 to holders of record September 15.

Dover & Rockaway R. R.—6 Per Cent Guaranteed, 3 per cent, semi-annually, payable October 1 to holders of record September 30.

Lackawanna R. R. Company of New Jersey.—4 Per Cent Guaranteed, 1 per cent, quarterly, payable October 1 to holders of record September 9.

Little Miami R. R.—Special Guaranteed, 50c, quarterly, Original Capital, $1.10, both payable September 10 to holders of record August 26.

Newark & Bloomfield.—$1.50, semi-annually, payable October 1 to holders of record September 22.

New York, Lackawanna & Western.—1¼ per cent, quarterly, payable October 1 to holders of record September 15.

Southern Railway—Mobile & Ohio Stock Trust Certificates.—2 per cent, semi-annually, payable October 1 to holders of record September 15.

Warren.—3½ per cent, semi-annually, payable October 15 to holders of record October 6.

Average Prices of Stocks and of Bonds

	Sept. 6	Last week	Last year
Average price of 20 representative railway stocks..	32.49	30.73	54.55
Average price of 20 representative railway bonds..	67.74	67.69	86.11

Railway Officers

EXECUTIVE

Nicolás Procel, who has been elected executive vice-president of the National Railways of Mexico, with headquarters at Mexico, D. F., has been connected with these lines continuously for 26 years. He was born in the state of Guanajuato, and after completing his education he became a telegraph operator on the National Railways in 1895. In 1904 he went with the Pullman Company as a conductor, and in 1906 he became an operator at Mexico, D. F., with the National Railways, later serving as per diem clerk, head clerk and chief clerk in the office of the superintendent of car service. In 1912, Mr. Procel was appointed chief clerk to the superintendent of transportation and two years later he was made chief clerk to the general superintendent of transportation. After serving for about a year as a clerk in the traffic department, Mr. Procel, in 1916, was appointed a clerk in the office of the general director of the National Railways, where he was advanced through the positions of sub-chief clerk and chief clerk. For a brief period in 1919 he served as chief clerk to the superintendent of car service, later returning to the position of chief clerk to the general director. In June, 1920, Mr. Procel was advanced to assistant general director, and five years later he was made chief clerk to the director and general manager. He was advanced to superintendent of car service, with headquarters at Mexico, D. F., on September 1, 1928, which position he was holding at the time of his recent election as executive vice-president, effective August 13.

FINANCIAL, LEGAL AND ACCOUNTING

Abolition of nine positions in the finance and accounting department of the Canadian National, the retirement of eight officers, and changes in positions of other officers of those departments became effective September 1. The following officers retired on pension: **H. W. Harding,** European secretary and treasurer, London, Eng.; **G. F. Ancrum,** treasurer, Montreal, Que.; **W. LeB. Ross,** treasurer, Winnipeg, Man.; **W. C. Tomkins,** treasurer, Detroit, Mich.; **J. E. Sonne,** assistant treasurer, express, Montreal; **J. C. Swalwell,** auditor of express accounts, Montreal; **W. C. Blake,** auditor of payrolls, Winnipeg, and **H. B. Stuart,** chief of valuation, Toronto. Changes in position are as follows: **H. G. Foreman,** assistant to the vice-president, has been appointed assistant treasurer, with headquarters at Montreal; **A. H. Coneybears,** assistant European secretary and treasurer, has been appointed European secretary and treasurer; **P. J. Farley,** assistant treasurer at Winnipeg, has been appointed regional treasurer, with the same headquarters; **J. A. Hill,** assistant auditor of express accounts, has been appointed auditor of express accounts, and **W. S. MacCulloch,** assistant chief of valuation, has been appointed chief of valuation at Toronto.

OPERATING

W. H. Hillis, who has been in charge of the construction of the Childress (Tex.)-Pampa line of the Ft. Worth & Denver City (a subsidiary of the Chicago, Burlington & Quincy), has returned to his former position as assistant superintendent of the LaCrosse division of the Burlington, with headquarters at North LaCrosse, Wis., succeeding **J. L. Mulroy,** who has been transferred to the Beardstown division, with headquarters at Centralia, Ill. Mr. Mulroy replaces **F. L. Goodman.**

E. J. Guthrie, superintendent of the Southern division of the Central Vermont, and marine superintendent of the Central Vermont Transportation Company, retired effective September 1, and **G. W. Groom,** formerly superintendent of the Northern division at St. Albans, Vt., has been transferred to New London, Conn., to fill the vacancy caused by Mr. Guthrie's retirement as Southern division superintendent. Mr. Groom will also have charge of operation of the Central Vermont Transportation Company, the position of marine superintendent of the marine subsidiary having been abolished. **M. E. Barnes,** formerly assistant to the vice-president at St. Albans, which position has been abolished, has been appointed superintendent of the Northern division, with the same headquarters, succeeding Mr. Groom. In addition to his duties as superintendent, Mr. Barnes will assist **Edmund Deschenes,** manager of the Central Vermont, in the operation of the property.

Mr. Guthrie entered the service of the Central Vermont 25 years ago after 20 years of service in the operating department of the Grand Trunk in Ontario. His first position was as agent at St. Albans, and he subsequently served in various capacities until January 1, 1915, when he was advanced to superintendent of the Southern division. Mr. Guthrie was appointed marine superintendent on December 1, 1925.

A number of territorial and official changes, including divisional consolidations, retirements and transfers, were made effective on September 1 in the operating departments of the Atlantic and Central regions of the Canadian National. The Montreal division has been combined with the Saguenay division, the territory formerly covered by the two being included in the new Laurentian division, with **G. R. Edgley,** previously superintendent of the Saguenay division, as superintendent of the combined divisions; while the St. Lawrence division superintendency has been merged with the office of **F. L. C. Bond,** general superintendent at Montreal, Que. **G. P. Clarke,** superintendent of car service at Toronto, Ont., and **W. N. Rippey,** superintendent at Moncton, N. B., have retired. The work of Mr. Clarke's office has been consolidated under the general superintendent of transportation at Toronto, while Mr. Rippey has been succeeded by **W. E. Robinson,** formerly superintendent at Campbellton, N. B., who has in turn been replaced by **J. E. Gibault,** hitherto superintendent of the former Montreal division. **C. J. McKeough,** superintendent of terminals at Black Rock, N. Y., has been appointed superintendent at Stratford, Ont., succeeding **W. E. Weegar,** deceased, and **E. W. Cameron,** assistant superintendent at Allandale, Ont., has been transferred in the same capacity to stratford, where he succeeds **J. E. Laporte,** who has been appointed superintendent of the Montreal & Southern Counties Railway, with headquarters at St. Lambert, Que., vice **W. H. McGann,** transferred. **H. C. White,** superintendent at Ottawa, Ont., has been appointed superintendent of terminals at Black Rock, replacing Mr. McKeough, while **A. B. McNaughton,** superintendent at Montreal, has been appointed to succeed Mr. White at Ottawa.

TRAFFIC

John W. Hanley, general freight and passenger agent of the Central Vermont, with headquarters at St. Albans, Vt., retired effective September 1. As a result of his retirement, the position of general freight and passenger agent has been abolished, and **J. L. Dempsey,** assistant

general freight agent at St. Albans, will assume the duties of assistant general passenger agent in addition to his present duties. For purposes of coordination, the New England territory of **H. A. Carson,** general freight agent, Canadian National-Grand Trunk, has been extended to include both divisions of the Central Vermont, and, likewise, the New England territory of **T. E. P. Pringle,** general agent of the Canadian National-Grand Trunk passenger department, has been extended to include the Central Vermont Lines.

Mr. Hanley, who is retiring as general freight and passenger agent, has had 51 years of service with the Central Vermont. He first entered railway service as an office boy in the audit office at St. Albans, in 1881. Shortly thereafter he was transferred to the passenger department, and served in various capacities until 1907, when he was appointed general passenger agent. In 1920, the positions of general freight agent and general passenger agent were consolidated and Mr. Hanley was given charge of the two departments with the title of general freight and passenger agent. Mr. Hanley was also a member of the board of directors of the Central Vermont Railway, Inc., in 1931.

ENGINEERING AND SIGNALING

A. F. Stewart, chief engineer of the Atlantic region of the Canadian National, with headquarters at Moncton, N. B., retired effective September 1, and has been succeeded by **H. T. Hazen,** assistant chief engineer at Montreal, Que. **J. A. Heaman,** chief engineer of the Grand Trunk Western at Detroit, Mich., has been appointed office engineer at Montreal. The position of engineer of construction at Toronto, Ont., has been abolished, and **R. A. Baldwin,** who formerly held that position, has been appointed district engineer at North Bay, Ont., replacing **C. H. N. Connell,** transferred.

MECHANICAL

A. R. Green has been appointed general car inspector of the New York, Ontario & Western, succeeding **Albert Kipp,** deceased. Mr. Green's headquarters will be located at New York.

O. H. Hagen has been re-appointed to his former position as superintendent of the steel car plant of the Chicago, Burlington & Quincy at Galesburg, Ill., effective September 1, when the plant was reopened after having been shut down since March 1. Since the closing of the plant, Mr. Hagen has been in charge of the repair tracks at Galesburg.

J. A. Conley, master mechanic of the Valley division of the Atchison, Topeka & Santa Fe, with headquarters at Calwa, Cal., has had his jurisdiction extended to include the San Francisco Terminal division, replacing **E. F. Callaher,** deceased. **E. Raitt,** assistant master mechanic, with headquarters at Prescott, Ariz., has been transferred to the San Francisco Terminal division, with headquarters at Richmond, Cal.

OBITUARY

Morris A. Zook, president of the Montana, Wyoming & Southern, who had held important engineering positions with many railroads throughout the country, died on September 3, at Mt. Vernon, N. Y. Mr. Zook was born on March 2, 1859, at Philadelphia, Pa., and graduated in civil engineering from the Pennsylvania Polytechnic College. During his railway engineering career, he served with the Norfolk & Western and the Shenandoah Valley (now part of the N. & W.), as resident engineer and division engineer in charge of heavy construction and location; with the Pennsylvania, Lines West of Pittsburgh, as engineer of maintenance; as engineer maintenance of way and general roadmaster of the Cincinnati Southern (now part of the Southern); as chief engineer of the Louisville, Evansville & St. Louis (now also a part of the Southern); as a special engineer in charge of emergency construction work with the Central of New Jersey; as chief engineer and later as consulting engineer of the Peabody Coal Company of Chicago, in which capacities he constructed, organized and operated the Chicago & Illinois Midland; as engineer reporting on the physical valuation of the New York, New Haven & Hartford; and as engineer of construction of the Chicago Great Western. In 1912, Mr. Zook became associated with J. W. Kendrick, Chicago, valuation engineer, where he engaged in the physical valuation of important railway systems. On January 1, 1914, he became resident engineer, Bureau of Valuation, of the Interstate Commerce Commission, with headquarters at Washington, D. C. On March 27, 1922, he was elected vice-president of the Montana, Wyoming & Southern being elected president shortly thereafter.

A. G. Wells, Vice-President Santa Fe, Dies

Arthur George Wells, vice-president in charge of operation of the Atchison, Topeka & Santa Fe System, with headquarters at Chicago, died on September 3, at the Presbyterian hospital in that city, of pneumonia which developed following a major operation three weeks previously. Mr. Wells had served the Santa Fe in various capacities continuously for nearly 40 years, although he was also connected with the company from 1881 to 1886. He was born on November 18, 1861, at Guelph, Ont., and was educated at Walker's Academy and Guelph Collegiate Institute. His first railway service was in 1876 as a machinist's apprentice with the Kansas City, St. Joseph & Council Bluffs (now part of the Chicago, Burlington & Quincy), and later he became a clerk in the mechanical department of the Burlington. In 1881, Mr. Wells went with the Atlantic & Pacific (now part of the A. T. & S. F.), as a clerk in the purchasing department, serving in various clerical positions until 1885, when he was made a trainmaster at Albuquerque, N. M. In 1886 he severed his connection with the Santa Fe to become assistant to the general manager of the Ohio & Mississippi (now part of the Baltimore & Ohio), going with the Cleveland, Cincinnati, Chicago & St. Louis four years later to serve successively as superintendent of the Peoria, Indianapolis and St. Louis divisions. He returned to the Santa Fe in 1893, as assistant to the first vice-president, with headquarters at Chicago, and two years later he was promoted to general superintendent of the Atlantic & Pacific. In 1897, Mr. Wells was further advanced to general superintendent of the Santa Fe lines west of Albuquerque, N. M., and

Arthur G. Wells

from March to September, 1900, he served as acting general manager of these lines, then returning to the position of general superintendent. Mr. Wells was appointed general manager of the same lines in 1901, with headquarters at Los Angeles, Cal., which position he occupied continuously until 1920, when he was elected vice-president in charge of operation for the system at Chicago, the position he was holding at the time of his death.

MALARIAL CONTROL WORK done by the Chicago, Rock Island & Pacific last year in Arkansas and Louisiana is estimated to have saved to the railway employees' families in these two states approximately $90,000 by the prevention of illness, according to a report made by W. P. Hale, sanitary inspector of the railroad. The report also points out that as a result of malarial prevention work among railroad employees in the malarial districts, an increase in efficiency of about 25 per cent has resulted. In addition, it is explained, some 30,000 patrons of the road living in towns where the work was carried on also were protected against illness. The total annual benefits derived from malarial control work to all concerned, the report says, are estimated at $150,000 for an expenditure of only about $5,000, largely for anti-mosquito measures. Malarial control work, according to Mr. Hale, results in improved earnings, in increased agricultural and industrial activities, and in general good-will.

THUMBS DOWN

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Revenues and Expenses of Railways

MONTH OF JULY AND SEVEN MONTHS OF CALENDAR YEAR 1932

Name of road		Av. mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net ry. operating income.	Net ry. operating income, 1931.
Akron, Canton & Youngstown	July	171	$104,031	$44	$110,037	$14,731	$14,926	$10,661	$38,597	$10,631	$88,741	80.7	$21,296	$9,074	—$2,015	$12,281
	7 mos.	171	884,187	366	934,765	107,856	101,405	71,464	286,056	76,534	637,915	68.2	296,850	211,691	141,812	174,062
Alton	July	1,017	884,388	161,586	1,171,035	176,258	124,022	57,209	469,173	46,353	884,807	75.6	286,228	176,198	7,297	194,598
	7 mos.	1,017	6,087,221	1,275,519	8,311,978	1,014,256	1,110,288	462,168	3,504,226	357,323	6,554,945	78.9	1,757,033	991,100	—7,556	432,236
Alton & Southern	July	31	.....	.....	61,221	6,294	6,067	4,877	24,580	5,638	47,456	77.52	13,765	7,958	5,706	19,406
	7 mos.	31	.....	.....	522,051	52,049	43,136	36,930	187,630	36,012	355,757	68.12	166,294	125,811	107,656	142,369
Atchison, Topeka & Santa Fe	July	9,725	8,200,826	1,231,755	10,105,073	940,742	2,057,002	310,280	2,932,552	400,080	6,634,256	65.7	3,470,817	2,529,164	2,669,093	5,680,364
	7 mos.	9,724	49,009,178	8,581,680	63,172,070	7,417,849	16,247,475	2,461,156	21,810,519	2,788,230	50,685,580	80.2	12,486,490	5,878,581	6,501,681	14,249,136
Gulf, Colorado & Santa Fe	July	1,955	1,088,230	49,518	1,200,157	135,658	236,064	49,222	400,467	71,066	890,065	74.2	310,092	210,352	129,738	1,123,765
	7 mos.	1,955	7,279,623	343,624	8,122,638	1,045,182	2,030,533	371,747	3,009,770	529,165	6,982,704	86.0	1,139,934	445,351	—219,732	423,870
Panhandle & Santa Fe	July	1,878	801,512	25,429	859,730	99,106	149,993	18,246	221,937	35,477	524,509	61.0	335,221	288,356	210,901	944,288
	7 mos.	1,877	4,299,467	224,232	4,867,437	1,014,801	1,207,229	138,563	1,577,360	231,674	4,164,828	85.6	702,609	324,019	—270,529	628,606
Atlanta & West Point	July	93	58,000	20,309	93,053	17,679	21,179	8,202	49,834	7,609	107,324	115.3	—14,271	—24,463	—37,002	—11,904
	7 mos.	93	489,431	140,904	752,754	127,422	163,028	58,764	363,973	65,123	799,854	106.3	—47,100	—118,667	—194,346	—35,255
Western of Alabama	July	133	53,886	21,304	86,167	20,010	25,873	7,949	44,138	7,376	107,714	125.0	—21,547	—32,126	—26,629	—1,070
	7 mos.	133	492,137	150,416	734,597	135,653	206,972	59,381	346,130	63,965	830,738	113.1	—96,141	—170,245	—134,470	57,163
Atlanta, Birmingham & Coast	July	639	143,487	6,384	175,936	45,628	56,656	21,835	94,782	16,395	245,160	139.3	—69,224	—82,399	—87,842	—45,108
	7 mos.	639	1,258,097	39,585	1,477,339	367,865	426,829	155,523	703,093	121,421	1,836,176	124.2	—358,837	—464,505	—548,267	—572,130
Atlantic Coast Line	July	5,144	1,639,715	226,063	2,065,438	494,826	640,508	113,397	1,090,003	130,370	2,479,778	120.1	—414,340	—664,816	—635,369	—374,395
	7 mos.	5,144	18,920,779	3,449,978	24,855,298	3,750,834	5,305,822	914,639	9,444,376	1,028,566	20,660,286	83.1	4,195,012	1,191,769	231,247	5,669,975
Charleston & Western Carolina	July	342	109,113	1,466	113,873	15,086	23,171	5,896	45,086	4,735	93,974	82.5	19,899	4,886	9,901	36,875
	7 mos.	342	977,495	10,936	1,019,326	162,008	178,039	44,561	391,358	36,949	812,849	79.7	206,477	91,418	90,467	287,873
Baltimore & Ohio	July	6,397	7,678,410	900,374	9,311,176	638,648	1,586,996	362,278	3,445,438	579,536	6,679,662	71.7	2,631,514	1,900,325	1,641,586	2,871,064
	7 mos.	6,397	62,466,198	6,534,130	74,661,188	6,550,185	14,043,787	3,047,127	28,254,343	4,441,371	56,967,880	76.3	17,693,308	12,468,025	10,683,758	15,258,750
Baltimore & Ohio Chic. Term	July	85	.....	.....	233,453	24,948	32,256	1,595	130,243	14,652	208,592	89.4	24,861	—14,462	80,112	95,600
	7 mos.	85	.....	.....	1,889,903	169,641	286,088	13,509	1,020,155	117,858	1,644,208	87.0	245,695	—23,216	568,154	559,887
Staten Island Rapid Transit	July	23	39,829	114,401	163,084	9,152	11,800	1,613	79,464	13,286	115,315	70.7	47,769	29,019	12,139	25,402
	7 mos.	23	325,562	689,505	1,065,788	53,395	90,633	13,800	573,105	98,125	829,058	77.8	236,730	108,555	3,713	96,581
Bangor & Aroostook	July	619	180,837	12,758	214,902	92,202	88,138	5,017	95,259	25,141	306,932	142.8	—92,030	—101,517	—91,077	—139,785
	7 mos.	619	3,917,175	158,786	4,233,836	626,178	665,978	32,685	919,036	173,499	2,424,904	57.3	1,808,932	1,434,157	1,374,854	1,010,246
Belt Ry. Co. of Chicago	July	53	.....	.....	285,015	21,351	30,319	2,591	144,323	7,296	205,880	72.2	79,135	40,683	149,734	102,982
	7 mos.	53	.....	.....	2,234,089	152,760	221,754	20,940	1,146,650	53,234	1,595,338	71.4	638,751	298,352	624,325	832,946
Bessemer & Lake Erie	July	225	313,319	1,274	320,250	52,635	132,499	10,567	104,413	38,851	338,813	105.8	—18,563	—46,823	—52,343	745,512
	7 mos.	226	1,878,941	9,394	1,933,983	345,284	1,082,512	81,006	786,027	284,204	2,578,873	133.3	—644,890	—794,658	—769,306	733,047
Boston & Maine	July	2,091	2,131,567	735,835	3,440,592	426,097	550,500	70,019	1,372,282	179,223	2,610,590	75.9	830,002	600,260	455,911	945,961
	7 mos.	2,092	17,706,671	5,022,442	27,055,579	3,658,865	4,206,328	515,747	10,409,432	1,318,292	20,193,142	74.6	6,862,437	5,207,127	4,076,252	6,147,982
Brooklyn Eastern Dist. Term	July	11	65,657	.....	66,177	3,816	10,686	398	22,221	5,157	42,278	63.9	23,899	17,306	17,306	35,631
	7 mos.	11	497,486	.....	503,134	33,110	59,709	1,335	161,107	42,557	297,818	59.2	205,316	157,856	157,856	260,609
Burlington-Rock Island	July	310	45,003	1,095	50,160	19,648	13,197	3,664	31,343	8,010	75,825	151.2	—25,665	—32,541	—40,069	108,092
	7 mos.	310	498,826	10,024	543,051	124,940	72,162	32,064	265,475	61,282	555,079	102.2	—12,028	—60,329	—141,991	—140,722
Cambria & Indiana	July	37	68,790	.....	69,003	8,965	34,433	562	9,983	8,165	62,108	90.00	6,895	—2,792	41,068	63,777
	7 mos.	37	613,275	.....	614,837	57,534	266,698	3,097	78,726	61,585	467,640	76.06	147,197	65,369	434,274	552,631
Canadian Pac. Lines in Maine	July	233	57,089	20,038	86,042	44,083	17,828	4,664	46,734	3,783	117,092	136.0	—31,050	—42,050	—58,452	—127,771
	7 mos.	233	939,643	124,836	1,151,033	302,065	220,832	34,222	477,732	28,172	1,063,023	92.3	88,010	11,010	—136,281	—214,348
Canadian Pac. Lines in Vermont	July	85	40,654	20,171	81,523	28,198	20,865	2,114	55,239	2,693	109,109	133.8	—27,586	—32,296	—52,996	—23,984
	7 mos.	85	397,852	105,867	637,316	134,637	159,440	15,334	409,640	20,517	739,568	116.0	—102,252	—135,222	—286,377	—296,930
Central of Georgia	July	1,944	651,188	90,789	828,371	120,579	185,003	55,824	413,324	69,860	848,928	102.5	—20,557	—124,398	—135,059	156,360
	7 mos.	1,944	5,397,785	721,640	6,947,834	904,500	1,353,345	388,774	3,158,985	500,724	6,356,878	91.5	590,956	—125,921	—246,422	1,203,419
Central New Jersey	July	692	1,572,888	576,397	2,308,059	194,497	429,415	64,306	984,883	91,795	1,779,897	77.1	528,162	—12,765	—79,807	217,021
	7 mos.	692	13,377,089	3,182,059	17,764,394	1,467,677	3,420,637	381,528	7,409,880	683,254	13,473,586	75.9	4,290,808	1,891,264	1,448,481	2,528,716
Central Vermont	July	457	350,201	58,329	462,816	106,754	81,653	15,791	191,571	20,425	416,297	89.9	46,519	29,089	13,555	75,065
	7 mos.	457	2,475,814	325,703	3,149,607	635,862	601,990	112,982	1,400,972	148,828	2,902,599	92.2	247,008	124,496	50,685	369,120
Chesapeake & Ohio	July	3,144	6,658,590	232,212	7,220,344	769,417	1,297,023	163,315	1,790,302	283,152	4,319,524	59.8	2,900,820	2,112,104	1,967,104	3,634,452
	7 mos.	3,144	49,531,379	1,639,872	53,417,706	5,576,889	9,774,418	1,129,213	13,347,935	2,145,499	32,101,589	60.1	21,316,117	15,799,420	15,269,209	19,564,963
Chicago & Eastern Illinois	July	938	690,184	93,958	869,861	132,536	158,755	56,778	419,167	57,505	831,987	95.6	37,874	—72,425	—191,085	—93,704
	7 mos.	938	5,582,765	676,491	6,958,968	925,691	1,376,224	424,297	3,229,377	413,505	6,422,820	92.3	536,148	—237,389	—1,104,186	—1,045,093

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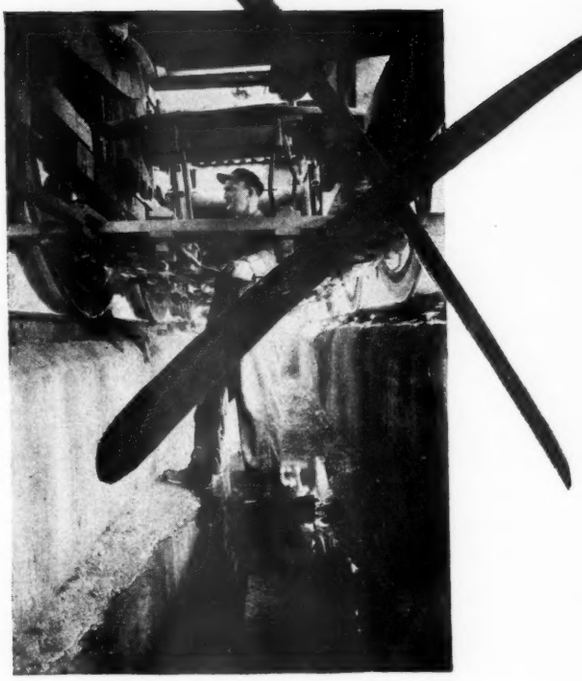
HAND ADJUSTMENT



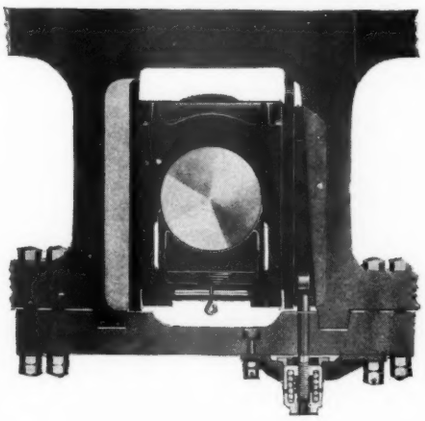
IS NOT GOOD ENOUGH . . .

Set-up an ordinary driving box wedge in the round-house as tight as you dare, and even then you must allow a little play to prevent a stuck box. That play soon grows to a clanking pound and shortly the brasses run hot or need attention.

But Franklin Automatic Adjustable Wedges eliminate all slack. They adjust themselves automatically with every revolution of the drivers. Slack has no opportunity to develop and cause trouble.

Franklin Automatic Adjustable Driving Box Wedges keep brasses from pounding their way into the shop. Use them to lower maintenance and keep modern power in service.

FRANKLIN AUTOMATIC ADJUSTABLE WEDGE



FRANKLIN RAILWAY SUPPLY COMPANY, INC.

NEW YORK CHICAGO MONTREAL

Revenues and Expenses of Railways

MONTH OF JULY AND SEVEN MONTHS OF CALENDAR YEAR 1932—CONTINUED

Name of road		Av. mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net ry. operating income.	Net ry. operating income, 1931.
Chicago & Illinois Midland	July	131	$86,075	$1,104	$95,050	$13,545	$31,360	$16,098	$39,501	$16,154	$116,658	122.7	—$21,608	—$28,411	—$45,165	$42,366
	7 mos.	131	1,111,992	10,440	1,170,569	105,458	259,622	128,664	364,442	117,191	974,382	83.2	196,187	137,043	76,744	154,490
Chicago & North Western	July	8,442	3,996,813	924,623	5,567,717	1,176,360	1,053,697	175,850	2,515,171	277,010	5,239,760	94.1	327,957	—282,107	—512,676	1,048,813
	7 mos.	8,442	30,394,914	6,324,765	41,619,674	6,512,039	8,415,437	1,169,060	18,430,608	2,041,975	36,834,780	88.5	4,784,894	147,115	—1,472,845	4,142,685
Chicago, Burlington & Quincy	July	9,260	4,275,628	707,474	5,709,020	912,437	1,063,353	214,083	2,243,092	291,924	4,774,043	83.6	934,977	264,698	—13,420	1,696,423
	7 mos.	9,267	35,903,054	4,491,889	45,665,063	5,485,330	7,984,983	1,568,132	17,071,837	2,086,905	34,547,238	75.7	11,117,825	6,329,514	4,437,071	11,912,535
Chicago, Great Western	July	1,484	941,790	59,253	1,080,696	222,365	141,301	58,644	441,801	48,883	916,145	84.8	164,551	90,600	—91,884	275,684
	7 mos.	1,489	7,788,928	445,850	8,849,810	1,141,029	1,140,623	434,214	3,528,648	393,185	6,652,775	75.2	2,197,035	1,679,820	358,894	1,507,376
Chicago, Indianapolis & Louisville	July	644	469,878	42,127	582,480	76,356	141,506	25,686	258,262	24,975	531,259	91.2	51,221	2,001	—83,751	—18,989
	7 mos.	644	3,642,957	403,181	4,605,231	494,419	1,008,891	187,494	2,058,608	189,961	3,988,276	86.6	616,955	225,203	—418,836	174,401
Chicago, Mil., St. Paul & Pac.	July	11,254	4,924,941	519,016	6,101,710	1,368,869	1,567,644	264,988	2,639,383	283,830	6,145,138	100.7	—43,428	—724,821	—1,177,139	1,383,864
	7 mos.	11,271	38,486,039	3,614,688	47,036,040	8,351,951	10,973,134	1,685,832	19,904,967	2,052,227	43,037,500	91.5	3,998,540	—988,202	—4,104,371	3,669,838
Chicago River & Indiana	July	20	.....	.....	318,195	22,500	20,000	1,366	103,368	11,356	158,590	49.8	159,605	137,979	190,396	235,698
	7 mos.	20	.....	.....	2,500,136	136,500	186,000	10,958	853,892	92,900	1,280,250	51.2	1,219,886	994,272	1,393,256	1,632,627
Chicago, Rock Island & Pac.	July	7,620	4,709,879	497,314	5,740,511	586,109	1,138,932	186,119	2,207,335	271,471	4,460,795	77.7	1,279,716	766,685	374,513	2,596,584
	7 mos.	7,620	31,567,317	4,029,394	39,699,626	3,600,044	7,946,145	1,400,108	16,494,932	2,023,904	31,972,927	80.5	7,726,699	4,139,367	1,655,306	8,328,008
Chicago, Rock Island & Gulf	July	721	400,052	21,485	426,468	43,342	29,888	17,071	121,044	17,780	231,464	54.3	195,004	171,814	101,465	571,396
	7 mos.	721	2,299,801	183,636	2,494,141	249,699	230,651	122,035	852,556	134,254	1,610,416	64.6	883,725	721,680	347,056	1,113,583
Chic., St. Paul, Minn. & Omaha	July	1,736	868,700	148,392	1,131,076	240,000	207,917	33,348	560,359	62,773	1,106,000	97.8	25,076	—53,569	—122,670	58,201
	7 mos.	1,736	6,495,389	1,036,463	8,303,801	1,423,579	1,621,356	237,901	4,044,138	449,259	7,822,623	94.2	481,178	—101,798	—589,896	63,939
Clinchfield R. R.	July	309	242,980	2,095	248,840	38,476	82,494	15,788	77,209	15,456	229,423	92.2	19,417	—40,583	—28,141	82,268
	7 mos.	309	2,258,963	16,782	2,310,324	318,067	624,089	117,077	500,151	101,730	1,661,114	71.9	649,210	198,933	279,020	887,791
Colorado & Southern	July	1,030	292,523	33,798	367,373	81,999	104,930	13,544	159,940	30,910	384,134	104.6	—16,761	—86,294	—103,796	27,312
	7 mos.	1,033	2,491,580	198,581	3,028,220	513,808	818,812	92,546	1,228,018	231,800	2,820,930	93.2	207,290	—278,184	—371,939	98,441
Ft. Worth & Denver City	July	804	526,545	45,422	626,773	35,317	61,646	17,790	149,730	31,697	279,473	44.6	347,300	314,980	284,359	799,921
	7 mos.	710	2,551,641	275,502	3,268,617	374,501	551,634	117,529	1,077,785	238,329	2,139,347	65.5	1,129,270	902,180	726,846	1,337,848
Columbus & Greenville	July	167	31,288	4,439	39,256	17,131	10,138	2,424	22,467	9,859	61,417	156.5	—22,161	—24,288	—21,870	3,812
	7 mos.	167	360,669	35,813	424,763	113,759	80,079	22,799	173,939	74,802	464,721	109.4	—39,958	—46,998	—36,152	61,805
Conemaugh & Black Lick	July	20	7,100	.....	16,807	3,810	5,775	315	10,674	2,925	23,499	139.8	—6,692	—7,192	—6,026	16,570
	7 mos.	20	92,027	.....	207,819	28,539	57,393	2,709	137,089	27,683	253,413	121.9	—45,594	—49,094	—40,726	—42,318
Delaware & Hudson	July	854	1,431,648	154,554	1,731,790	276,114	507,633	57,948	768,024	140,338	1,764,321	101.9	—32,531	—119,016	—130,737	379,021
	7 mos.	854	11,734,178	813,931	13,590,711	2,178,358	3,776,858	366,471	5,802,282	1,023,989	13,173,158	96.9	417,553	—201,498	—215,396	1,861,977
Del., Lackawanna & Western	July	998	2,348,749	652,403	3,528,154	365,385	733,613	122,106	1,549,450	149,815	2,948,493	83.6	579,661	134,352	98,897	530,125
	7 mos.	998	18,958,049	4,503,957	27,485,526	2,825,953	5,406,653	875,668	11,982,877	1,095,686	22,394,625	81.5	5,090,901	2,118,314	2,036,568	4,468,984
Denver & Rio Grande Western	July	2,513	999,399	134,431	1,229,593	192,349	270,376	48,495	414,298	74,217	1,013,134	82.4	216,459	51,211	57,781	354,145
	7 mos.	2,544	7,522,967	615,362	8,795,631	1,172,781	2,344,728	333,896	3,131,319	553,719	7,592,453	86.3	1,203,178	45,068	134,721	2,166,793
Denver & Salt Lake	July	232	78,243	4,913	94,362	26,450	19,898	1,635	21,264	9,538	74,271	78.7	20,091	6,091	9,363	3,716
	7 mos.	232	801,288	45,013	925,636	154,998	181,143	12,558	174,790	71,116	581,531	62.8	344,105	233,014	261,723	205,612
Detroit & Mackinac	July	242	53,234	3,812	66,233	14,008	8,811	1,279	23,996	4,388	52,433	79.1	13,800	8,137	9,075	18,047
	7 mos.	242	316,452	21,820	386,728	88,820	68,930	9,518	164,708	28,542	360,378	93.1	26,350	5,314	5,018	110,837
Detroit & Toledo Shore Line	July	50	110,973	.....	112,576	10,455	18,339	7,669	41,948	6,571	84,982	75.5	27,594	14,969	—13,282	15,589
	7 mos.	50	1,333,057	.....	1,345,792	139,727	162,772	51,796	368,601	47,759	770,065	57.2	575,727	444,686	169,306	298,820
Detroit Terminal	July	19	.....	.....	34,228	4,518	7,109	1	23,837	2,691	38,156	114.4	—3,928	—15,880	—18,546	—16,342
	7 mos.	19	.....	.....	400,407	44,881	54,288	49	218,000	21,848	339,066	84.7	61,341	—22,681	—66,934	—18,969
Detroit, Toledo & Ironton	July	487	353,354	330	360,535	58,383	68,838	10,996	114,496	20,808	271,339	75.3	89,196	46,225	47,657	61,586
	7 mos.	487	2,667,229	3,142	2,735,779	355,746	506,878	81,657	892,496	157,615	1,990,000	72.7	745,779	430,083	384,197	881,686
Duluth, Missabe & Northern	July	563	370,641	1,972	417,376	90,433	102,980	3,755	134,473	40,550	372,121	89.2	45,255	22,475	22,433	1,338,336
	7 mos.	563	762,650	10,915	915,651	627,240	1,104,761	23,180	867,285	280,975	2,903,329	317.1	—1,987,678	—2,027,575	—2,025,266	—314,876
Duluth, Winnipeg & Pacific	July	178	50,382	5,803	60,431	28,523	19,807	2,861	39,130	4,881	95,962	158.8	—35,531	—38,167	—24,005	—54,021
	7 mos.	178	485,485	22,653	535,741	156,542	139,533	22,220	273,730	40,804	636,998	118.9	—101,257	—128,460	—4,037	—191,398
Elgin, Joliet & Eastern	July	447	471,342	.....	511,056	82,920	143,319	12,166	258,945	50,320	547,669	107.2	—36,613	—152,258	—179,484	—133,475
	7 mos.	447	4,469,555	23	4,851,433	639,475	1,153,098	93,251	2,226,178	388,005	4,499,757	92.8	351,676	—446,171	—696,980	383,306
Erie Railroad	July	2,046	3,933,490	566,351	5,035,907	653,480	1,074,657	141,625	1,926,048	242,373	4,056,578	80.6	979,329	598,042	423,130	641,642
	7 mos.	2,046	30,498,495	3,610,393	37,651,181	4,279,346	8,117,395	1,018,928	14,369,496	1,790,193	29,736,423	79.0	7,914,758	5,138,998	4,224,538	6,356,331
Chicago & Erie	July	269	594,855	27,215	677,029	108,480	100,879	23,671	197,355	32,489	462,238	68.3	214,791	165,430	—40,491	—53,323
	7 mos.	269	4,473,644	175,068	5,030,940	702,100	781,438	173,441	1,484,731	241,966	3,381,957	67.2	1,648,983	1,280,070	—102,192	315,099

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THERE'S MORE TO SECURITY ARCHES THAN JUST BRICK

AN ARCH
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IN every section of the country the pick of the brick plants supply Arch Brick to the railroads exclusively thru the American Arch Company.

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Locomotive Combustion Specialists

The above plants supply the brick. American Arch Company supplies the design, engineering, and the service that, taken together, make a satisfactory Arch Brick supply.

Revenues and Expenses of Railways

MONTH OF JULY AND SEVEN MONTHS OF CALENDAR YEAR 1932—CONTINUED

Name of road		Av. mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net ry. operating income.	Net ry. operating income, 1931.
New Jersey & New York	July	45	$14,524	$72,977	$89,995	$11,847	$24,657	$1,514	$46,576	$3,074	$87,668	97.4	$2,327	—$2,674	—$20,866	—$13,252
	7 mos.	45	115,806	513,024	648,006	65,636	171,870	10,665	345,840	24,316	618,328	95.4	29,678	—6,494	—144,526	—100,697
N. Y., Susquehanna & Western	July	131	206,009	32,773	253,490	30,222	47,652	4,541	103,052	9,523	194,979	76.9	58,511	26,228	13,157	4,439
	7 mos.	131	1,666,740	212,710	2,016,903	212,457	345,636	32,956	806,985	77,670	1,475,671	73.2	541,232	315,450	199,073	401,257
Florida East Coast	July	863	157,114	58,412	249,629	104,928	131,411	19,253	124,742	38,197	421,404	168.8	—171,775	—272,152	—289,648	—235,050
	7 mos.	864	2,948,578	1,209,878	4,765,623	770,028	949,070	159,311	1,300,647	288,585	3,523,085	73.9	1,242,538	542,201	202,234	1,006,969
Fort Smith & Western	July	249	37,314	859	41,498	17,054	7,536	4,541	16,270	4,493	49,999	120.5	—8,501	—10,901	—16,576	—24,702
	7 mos.	249	315,721	8,146	352,118	92,866	71,642	32,240	151,248	32,804	380,964	108.2	—28,846	—43,865	—81,658	—93,077
Galveston Wharf	July	11	.....	.....	117,460	41,568	3,641	3,218	19,355	5,507	79,911	68.0	37,549	14,543	14,669	64,013
	7 mos.	11	.....	.....	1,055,425	312,015	33,228	25,395	163,127	44,914	681,925	64.6	373,500	212,066	212,092	141,892
Georgia R. R.	July	329	171,036	16,842	204,077	23,595	38,819	17,293	103,576	13,164	183,351	89.8	20,726	15,185	30,112	58,823
	7 mos.	329	1,380,312	117,569	1,638,649	227,791	320,037	130,583	803,154	117,490	1,584,433	96.7	54,216	2,181	90,010	369,579
Georgia & Florida	July	463	58,545	1,626	64,001	17,745	13,301	8,531	32,077	6,433	78,266	122.3	—14,265	—20,965	—23,414	—5,327
	7 mos.	463	457,512	10,269	501,195	135,212	108,350	60,246	234,696	45,816	585,399	116.8	—84,204	—131,118	—148,646	—64,074
Grand Trunk Western	July	1,023	794,502	72,247	961,865	182,862	241,348	43,049	520,241	89,008	1,080,187	112.3	—118,322	—203,471	—280,989	—106,429
	7 mos.	1,022	7,305,144	495,232	8,496,466	1,199,428	1,879,972	334,264	4,283,682	635,659	8,387,812	98.7	108,654	—591,831	—1,240,897	—565,427
Canadian National Lines in N. Eng.	July	172	63,912	9,625	85,660	26,043	16,400	3,367	56,466	9,394	112,892	131.8	—27,232	—34,862	—87,652	—111,624
	7 mos.	172	548,622	63,552	704,720	152,882	147,845	26,207	442,080	64,710	853,539	121.1	—148,819	—241,229	—549,222	—712,522
Great Northern	July	8,460	3,074,667	393,572	3,917,231	959,965	1,213,399	177,376	1,611,805	190,041	4,172,597	106.5	—255,366	—837,711	—980,581	1,272,821
	7 mos.	8,372	22,718,998	2,416,645	28,412,619	5,117,821	7,465,001	1,312,658	11,922,227	1,357,744	27,418,750	96.5	993,869	—3,029,694	—4,063,561	3,442,982
Green Bay & Western	July	234	83,600	1,557	87,858	24,207	12,535	4,692	39,835	2,457	83,710	95.2	4,148	—1,852	—4,367	17,480
	7 mos.	234	647,045	10,229	675,279	137,168	112,168	31,035	298,221	19,373	597,281	88.4	77,998	31,995	15,932	44,579
Gulf & Ship Island	July	307	42,699	9,687	65,473	8,192	13,360	2,887	44,849	5,461	74,749	114.2	—9,276	—26,971	—34,263	—26,338
	7 mos.	307	454,087	71,609	609,829	71,986	96,616	23,687	359,047	47,597	601,659	98.7	8,170	—112,183	—179,260	—344,792
Gulf, Mobile & Northern	July	733	208,177	10,211	232,430	41,400	49,883	21,681	92,603	17,402	222,969	95.93	9,461	—14,421	—35,839	12,904
	7 mos.	733	1,650,518	69,770	1,836,417	299,864	385,283	160,144	710,921	128,742	1,684,954	91.75	151,463	—10,675	—147,922	13,551
Illinois Central	July	5,014	4,632,224	605,593	5,731,204	445,877	1,283,512	189,546	2,196,660	314,255	4,459,944	77.8	1,271,260	820,904	680,879	1,198,153
	7 mos.	5,017	35,216,689	5,192,634	44,707,276	3,926,695	9,250,716	1,424,156	17,304,673	2,232,502	34,425,298	77.0	10,281,978	6,461,058	5,658,594	5,415,800
Yazoo & Mississippi Valley	July	1,673	648,216	78,817	793,688	65,630	126,114	31,372	369,804	52,860	647,200	81.5	146,488	13,231	—63,858	—81,537
	7 mos.	1,676	5,519,465	579,254	6,642,433	677,087	974,437	229,619	3,004,141	380,590	5,285,385	79.6	1,357,048	405,051	—201,247	—906,415
Illinois Central System	July	6,687	5,280,440	684,410	6,524,892	511,507	1,409,626	220,918	2,566,464	367,115	5,107,144	78.3	1,417,748	834,135	617,021	1,116,616
	7 mos.	6,693	40,736,154	5,771,888	51,349,709	4,603,782	10,225,153	1,653,775	20,308,814	2,613,092	39,710,683	77.3	11,639,026	6,866,109	5,456,847	4,509,385
Illinois Terminal	July	542	255,249	47,333	317,523	41,915	46,466	15,733	131,263	18,925	252,952	79.66	64,571	47,428	21,641	123,420
	7 mos.	543	2,103,298	400,815	2,632,244	339,084	349,647	111,947	1,008,733	163,441	1,968,686	74.79	663,558	480,900	294,243	883,369
Kansas City Southern	July	783	526,961	29,859	649,978	74,504	117,020	40,855	234,615	56,368	523,397	80.5	126,581	38,202	10,236	138,448
	7 mos.	783	4,253,168	185,778	5,167,168	527,842	907,767	312,709	1,734,696	453,061	3,950,925	76.5	1,216,243	598,605	424,858	1,423,605
Texarkana & Ft. Smith	July	99	68,568	2,009	100,160	10,608	9,729	5,222	29,517	10,632	67,834	67.7	32,326	23,451	3,295	66,150
	7 mos.	99	567,663	11,672	676,730	89,971	60,638	42,872	211,414	63,497	478,565	70.7	198,165	136,104	1,788	282,184
Kansas, Oklahoma & Gulf	July	326	123,123	419	126,258	17,713	20,068	7,462	33,877	6,852	85,630	67.8	40,628	29,285	15,413	54,487
	7 mos.	326	1,013,946	3,106	1,037,027	128,467	116,894	68,524	267,027	58,226	638,376	61.6	398,651	291,320	192,389	367,781
Lake Superior & Ishpeming	July	160	21,032	54	23,978	17,840	9,290	519	14,093	5,667	47,409	197.7	—23,431	—38,283	—39,028	104,507
	7 mos.	160	160,200	670	174,088	114,567	93,081	3,888	110,498	39,678	361,712	207.8	—187,624	—289,865	—297,050	—32,549
Lake Terminal	July	12	.....	.....	43,353	2,620	4,401	.....	13,974	1,819	22,814	52.6	20,539	17,603	22,454	23,251
	7 mos.	12	.....	.....	160,858	17,195	25,886	.....	93,789	13,788	150,658	93.7	10,200	—8,517	—4,126	6,263
Lehigh & Hudson River	July	96	107,235	375	114,685	11,815	16,620	2,951	42,301	7,833	81,520	71.1	33,165	20,548	10,256	15,237
	7 mos.	96	873,612	3,178	937,366	133,565	155,480	22,896	336,848	59,208	707,997	75.5	229,369	142,085	50,969	120,283
Lehigh & New England	July	216	228,664	521	231,168	28,262	54,406	4,267	84,733	15,563	187,231	81.0	43,937	36,339	41,881	53,146
	7 mos.	216	1,878,146	3,478	1,901,332	254,218	421,980	35,183	669,207	130,341	1,510,888	79.5	390,444	322,999	386,647	481,781
Lehigh Valley	July	1,362	2,185,469	220,390	2,674,370	311,682	684,565	121,724	1,287,134	123,421	2,543,568	95.1	130,802	—99,685	—196,047	77,281
	7 mos.	1,362	18,810,134	1,728,044	22,665,880	1,799,223	5,257,686	844,994	10,064,494	884,721	18,959,794	83.6	3,706,086	1,946,792	1,268,882	2,930,502
Louisiana & Arkansas	July	608	270,259	10,436	302,766	37,351	51,342	21,731	86,183	17,442	214,907	71.0	87,859	45,451	42,541	188,723
	7 mos.	608	2,116,691	64,087	2,358,091	378,896	392,214	151,492	650,023	144,474	1,715,602	72.8	642,489	341,474	349,006	710,498
Louisiana, Arkansas & Tex.	July	202	38,481	510	44,054	14,165	6,230	4,731	19,219	5,387	49,732	112.9	—5,678	—8,911	—13,920	—11,763
	7 mos.	202	291,322	2,879	327,383	91,386	47,370	24,893	131,515	31,231	326,061	99.6	1,322	—20,174	—56,860	—68,004
Louisville & Nashville	July	5,263	3,688,191	414,277	4,491,413	643,911	982,485	165,419	1,782,384	262,797	3,864,728	86.0	626,685	187,091	216,779	766,067
	7 mos.	5,263	29,893,646	3,250,640	36,223,420	5,856,711	8,220,673	1,267,729	14,342,990	2,083,140	31,972,976	88.3	4,250,444	1,112,884	1,201,507	5,582,745

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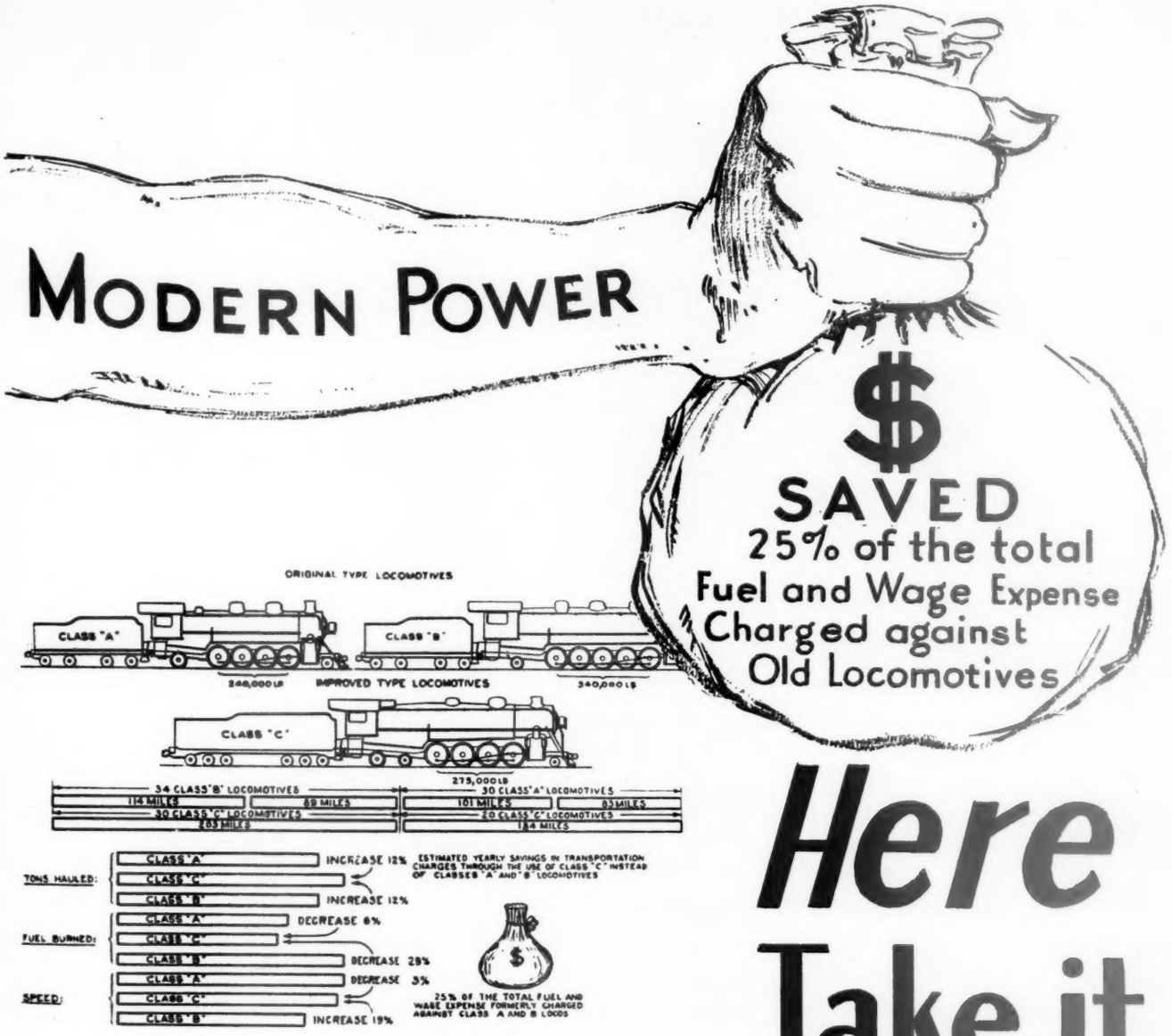
MODERN POWER



Here Take it

To Economize Modernize

IT'S yours if you modernize.

The above chart represents a typical example of how one railroad saved 25 per cent in transportation expense by modernizing.

Here are the facts. 30 locomotives designated as Class "A" were in freight service on divisions of 101, and 83 miles; 34 locomotives designated as class "B" were in service on adjacent divisions of 114 and 89 miles respectively. 50 modern locomotives, designated as class "C", replaced 64 older locomotives and handled increased tonnage, on faster schedule and with longer engine runs over two divisions combined, at a saving of 25 per cent in transportation expense. This does not include savings in maintenance and terminal expenses.

A 25 per cent saving in these days or any other days, is big enough to justify a thorough examination of your equipment.

Modernize—it is one sure means of securing larger profits from a smaller volume of business.

Cost reduction is always a sound investment.

American Locomotive Company
30 Church Street New York N.Y.

Revenues and Expenses of Railways

MONTH OF JULY AND SEVEN MONTHS OF CALENDAR YEAR 1932—CONTINUED

Name of road		Av. mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net ry. operating income.	Net ry. operating income, 1931.
Maine Central	July	1,121	$619,902	$122,232	$846,924	$150,975	$150,468	$16,684	$348,417	$38,427	$706,123	83.4	$140,801	$82,622	$56,655	$168,813
	7 mos.	1,121	5,432,892	774,641	6,919,645	1,124,986	1,138,024	115,032	2,724,397	298,628	5,403,397	78.0	1,516,248	1,117,726	854,230	1,155,105
Midland Valley	July	363	88,123	586	92,588	21,301	10,391	3,422	27,032	7,156	68,930	74.4	23,658	14,533	10,226	58,996
	7 mos.	363	826,733	4,913	857,890	133,961	106,647	28,014	223,781	56,496	545,446	63.6	312,444	235,288	185,402	241,099
Minneapolis & St. Louis	July	1,627	505,160	20,811	564,874	135,434	124,277	31,173	294,987	42,172	627,707	111.1	—62,833	—105,107	—128,714	121,742
	7 mos.	1,627	3,802,267	157,250	4,261,686	712,626	938,787	220,928	2,250,918	294,670	4,414,868	103.6	—153,182	—464,982	—611,285	102,407
Minneapolis, St. Paul & S. S. Marie	July	4,349	1,470,163	170,772	1,819,036	309,888	426,684	72,810	779,684	106,848	1,709,279	94.0	109,757	—63,963	—208,532	228,445
	7 mos.	4,349	10,288,939	855,192	12,275,285	1,879,142	3,069,141	484,612	5,734,294	761,396	11,973,973	97.5	301,312	—938,834	—1,881,136	103,794
Duluth, South Shore & Atlantic	July	560	114,537	14,092	144,152	47,102	30,122	6,219	68,439	8,448	161,399	112.0	—17,247	—43,420	—45,640	—45,863
	7 mos.	560	786,420	101,511	992,309	242,544	234,584	46,578	518,179	61,385	1,111,848	112.0	—119,539	—310,577	—329,317	—154,376
Spokane International	July	163	38,557	2,305	44,919	14,434	5,456	2,734	21,377	5,021	49,618	110.5	—4,699	—9,748	—12,172	2,721
	7 mos.	163	260,853	17,574	308,120	106,310	34,939	20,232	156,755	35,097	357,266	116.0	—49,146	—84,467	—100,989	11,116
Mississippi Central	July	150	37,721	1,297	40,696	4,807	7,976	7,150	16,099	5,224	41,248	101.4	—552	—4,283	—7,799	22,635
	7 mos.	150	314,434	8,981	337,297	60,674	83,648	54,890	128,350	39,467	367,021	108.8	—29,724	—55,914	—80,245	50,060
Missouri & North Arkansas	July	364	57,535	1,742	63,698	18,987	8,701	6,792	24,995	6,467	65,897	103.5	—2,199	—4,693	—11,774	—13,935
	7 mos.	364	451,978	9,677	497,381	117,695	80,448	56,076	213,219	54,630	520,704	104.7	—23,323	—40,556	—98,317	—47,050
Missouri-Illinois	July	202	73,194	416	75,249	13,036	14,358	2,705	23,651	5,411	59,156	78.6	16,093	10,708	5,449	19,991
	7 mos.	202	499,827	3,419	515,201	91,507	91,710	23,185	170,820	39,982	417,076	81.0	98,125	61,521	12,601	75,753
Missouri-Kansas-Texas Lines	July	3,188	1,742,250	180,373	2,119,211	277,606	291,243	101,444	725,262	123,489	1,531,383	72.3	587,828	397,183	248,367	452,677
	9 mos.	3,188	12,431,395	1,326,699	15,364,043	1,926,814	2,310,653	800,153	5,508,013	941,178	11,593,058	75.5	3,770,985	2,308,350	1,184,243	1,547,255
Missouri Pacific	July	7,436	4,600,924	408,385	5,465,732	616,116	1,062,204	222,111	2,040,667	257,170	4,220,759	77.2	1,244,973	976,356	619,638	1,665,105
	7 mos.	7,436	33,463,878	2,865,124	40,196,493	4,450,662	7,477,448	1,667,477	15,939,365	1,995,654	31,723,377	78.9	8,473,116	5,859,891	3,673,246	10,278,572
Gulf Coast Lines	July	1,030	413,615	35,067	482,297	63,205	116,621	31,282	156,477	41,192	410,094	85.03	72,203	25,358	9,120	32,982
	7 mos.	1,030	4,806,262	284,322	5,405,681	602,881	914,125	261,411	1,444,342	323,310	3,546,100	65.60	1,859,581	1,524,382	1,021,446	1,380,295
International-Great Northern	July	1,159	597,608	73,629	743,472	102,834	139,440	27,353	319,044	46,870	642,724	86.45	100,748	61,449	2,180	386,378
	7 mos.	1,159	4,862,159	476,763	5,952,070	819,159	1,115,395	215,714	2,548,981	369,297	5,129,530	86.18	822,540	528,450	3,919	1,775,996
San Antonio, Uvalde & Gulf	July	316	45,597	6,232	60,683	26,875	10,328	3,910	17,575	4,706	63,191	104.1	—2,508	—7,269	—29,227	—3,812
	7 mos.	316	559,295	43,121	649,821	144,391	84,295	33,397	160,808	37,173	454,612	70.0	195,209	162,748	—19,658	14,335
Mobile & Ohio	July	1,239	491,691	27,169	560,883	94,353	130,588	42,506	258,834	40,490	567,449	101.2	—6,566	—58,933	—117,164	—17,982
	7 mos.	1,215	4,126,950	165,604	4,606,234	704,323	887,180	314,396	2,044,165	281,203	4,230,761	91.8	375,473	—36,082	—461,298	20,318
Monongahela	July	177	248,639	734	251,916	22,103	19,116	816	49,881	6,995	98,933	39.3	152,983	139,254	77,773	121,490
	7 mos.	177	2,132,308	7,534	2,153,408	214,472	210,818	7,651	463,696	55,501	952,432	44.2	1,200,976	1,093,816	611,886	728,878
Monongahela Connecting	July	6	.....	.....	31,815	8,546	18,406	45	20,985	2,657	50,639	159.2	—18,824	—23,876	—23,784	—8,890
	7 mos.	6	.....	.....	295,833	57,249	148,455	745	189,275	18,642	414,366	140.1	—118,533	—152,978	—153,484	369
Montour	July	57	76,978	.....	77,485	13,520	29,829	1,107	16,153	6,241	66,850	86.3	10,635	8,806	27,790	116,999
	7 mos.	57	775,898	.....	778,023	88,939	248,031	9,745	194,969	48,345	590,017	75.8	188,006	173,914	299,185	506,069
Nashville, Chattanooga & St. Louis	July	1,203	669,459	74,393	822,225	104,462	158,608	53,278	362,370	52,576	735,460	89.4	86,765	41,693	38,595	45,629
	7 mos.	1,203	5,432,549	572,574	6,714,207	1,018,011	1,519,619	417,878	2,832,010	399,873	6,218,773	92.6	495,434	192,012	139,654	533,720
Nevada Northern	July	165	21,502	460	26,471	8,692	3,091	746	6,904	3,857	23,290	87.9	3,181	—4,713	—506	—252,117
	7 mos.	165	150,798	13,870	196,978	66,521	30,698	5,498	62,837	26,840	192,394	97.7	4,584	—46,632	—19,886	—220,875
Newburgh & South Shore	July	6	.....	.....	34,901	9,261	14,653	.....	25,388	Cr. 48	49,254	141.1	—14,353	—24,394	—22,907	2,884
	7 mos.	6	.....	.....	363,689	59,033	125,400	.....	194,768	34,445	413,646	113.7	—49,957	—128,897	—107,035	—60,944
New Orleans Great Northern	July	264	106,260	11,143	122,051	13,431	17,266	13,161	41,097	6,711	91,666	75.1	30,385	19,565	—1,165	53,921
	7 mos.	264	875,532	55,359	964,948	101,869	129,600	87,482	322,525	54,194	695,670	72.1	269,278	194,717	28,905	253,592
New Orleans Terminal	July	20	417	.....	95,472	8,588	6,087	.....	30,406	1,481	46,562	48.8	48,910	37,337	13,856	57,368
	7 mos.	20	8,406	.....	783,020	71,127	49,874	.....	226,540	8,942	356,483	45.5	426,537	345,563	215,868	195,727
New York Central	July	11,517	13,087,974	4,970,193	21,074,667	2,180,386	4,948,312	602,466	8,453,239	1,042,017	17,537,817	83.2	3,536,850	884,446	—161,870	2,717,056
	7 mos.	11,498	112,941,336	37,220,555	174,226,509	18,278,734	38,577,972	4,356,823	67,560,614	8,026,792	139,370,034	80.0	34,856,475	16,068,661	7,323,539	19,490,273
Indiana Harbor Belt	July	120	.....	.....	506,069	43,000	43,000	3,744	202,611	18,555	319,276	63.1	186,793	144,070	95,075	120,446
	7 mos.	119	.....	.....	4,215,776	425,000	421,000	29,688	1,716,763	146,771	2,843,767	67.5	1,372,009	1,074,091	731,637	917,754
Pittsburgh & Lake Erie	July	235	814,852	49,878	889,851	70,333	342,099	28,531	349,666	56,505	848,865	95.4	40,986	—47,748	76,483	258,122
	7 mos.	235	6,521,443	427,524	7,165,998	609,379	2,491,901	196,289	2,871,926	444,557	6,626,070	92.5	539,928	—78,554	793,628	2,115,824
New York, Chicago & St. Louis	July	1,691	2,083,138	80,767	2,252,943	318,032	376,657	104,542	833,673	116,745	1,750,187	77.7	502,756	341,818	102,351	191,625
	7 mos.	1,697	16,107,076	578,791	17,376,333	2,407,830	3,068,981	782,192	6,562,293	888,097	13,700,916	78.8	3,675,417	2,367,112	667,737	1,884,694
N. Y., New Haven & Hartford	July	2,083	2,880,535	1,967,075	5,503,331	856,083	905,291	87,182	2,045,867	242,951	4,247,191	77.2	1,256,140	880,590	413,797	1,244,357
	7 mos.	2,082	24,596,060	15,144,604	45,309,593	5,723,860	6,869,301	599,355	16,178,421	1,748,504	32,076,202	70.8	13,233,391	10,181,824	6,801,503	10,973,364

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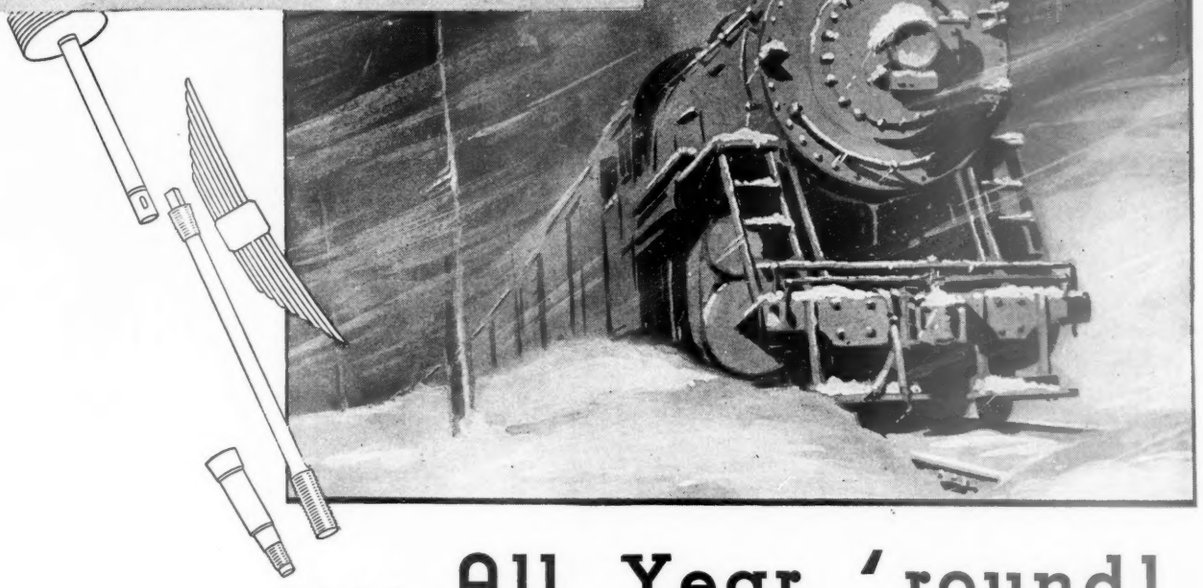
STRONG



.... All Year 'round!

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The Birdsboro Steel Foundry & Machine Company of Birdsboro, Penna., has manufactured and is prepared to supply under license, Toncan Copper Molybdenum Iron castings for locomotives.

CENTRAL ALLOY DIVISION

REPUBLIC STEEL CORPORATION

MASSILLON OHIO

Revenues and Expenses of Railways

MONTH OF JULY AND SEVEN MONTHS OF CALENDAR YEAR 1932—CONTINUED

Name of road		Av. mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net ry. operating income.	Net ry. operating income, 1931.
New York Connecting	July	20	$215,818	.....	$222,461	$10,074	$7,072	.....	$27,318	$860	$45,324	20.4	$177,137	$139,537	$99,356	$18,462
	7 mos.	20	1,253,049	.....	1,324,006	86,079	30,134	.....	200,753	7,706	324,672	24.5	999,334	742,534	468,063	393,153
New York, Ontario & Western	July	568	561,029	$182,940	854,081	154,985	138,327	$13,263	313,664	22,957	644,066	75.4	210,015	154,985	117,335	341,179
	7 mos.	568	4,831,105	362,478	6,052,793	697,221	1,023,729	96,180	2,282,369	173,349	4,298,286	71.0	1,754,507	1,428,802	1,025,695	1,061,151
Norfolk & Western	July	2,268	4,252,630	140,537	4,555,232	448,956	761,452	110,302	1,195,275	210,251	2,735,266	60.0	1,819,966	1,244,776	1,320,596	2,343,377
	7 mos.	2,268	31,894,250	1,001,301	34,246,408	3,923,138	6,882,795	792,440	9,333,947	1,696,411	22,735,708	66.4	11,510,700	7,328,607	7,852,046	12,431,062
Norfolk Southern	July							Not yet	filed							
	7 mos.							Not yet	filed							
Northern Pacific	July	6,735	2,818,801	351,814	3,529,662	592,312	872,478	165,399	1,429,865	240,984	3,352,074	95.	177,588	—431,688	—206,366	375,041
	7 mos.	6,735	20,419,895	2,338,460	25,481,123	3,801,683	6,600,283	1,179,210	10,942,309	1,867,751	24,750,116	97.1	731,007	—3,544,539	—1,731,006	1,473,136
Northwestern Pacific	July	441	199,527	115,502	346,883	28,368	94,204	4,542	147,961	14,098	288,968	83.3	57,915	35,249	16,544	110,013
	7 mos.	441	953,337	662,092	1,823,321	318,624	398,600	35,568	1,007,485	107,733	1,866,928	102.4	—43,607	—252,014	—337,121	—361,517
Oklahoma City-Ada-Atoka	July	132	28,855	422	31,280	7,383	2,111	919	10,007	1,520	21,940	70.1	9,340	5,722	—2,416	8,251
	7 mos.	132	222,776	3,105	239,549	59,378	16,684	6,985	82,457	12,567	178,084	74.3	61,465	31,166	—23,305	23,349
Pennsylvania Railroad	July	10,897	17,139,853	4,701,701	24,706,361	1,944,244	4,702,968	580,393	9,530,763	1,289,022	18,303,298	74.1	6,403,063	3,623,009	2,503,674	4,431,645
	7 mos.	10,897	139,210,176	37,192,902	198,500,368	16,520,105	40,049,687	4,517,812	75,373,565	10,076,886	148,893,511	75.0	49,606,857	32,642,716	26,235,269	28,154,297
Long Island	July	399	433,818	2,135,202	2,691,961	189,794	300,098	19,362	941,380	54,092	1,505,281	55.9	1,186,680	838,182	653,862	927,390
	7 mos.	399	4,031,996	11,960,306	16,915,457	1,273,990	2,431,057	97,219	7,297,839	403,177	11,503,243	68.0	5,412,214	4,059,764	2,795,223	4,492,995
Peoria & Pekin Union	July	17	11,579	.....	61,219	7,580	7,230	1,774	29,688	9,757	56,029	91.5	5,190	—10,310	16,653	12,524
	7 mos.	17	63,773	Dr. 3	486,947	54,555	53,076	13,814	239,900	54,128	415,473	85.3	71,474	—40,887	123,269	135,833
Pere Marquette	July	2,320	1,299,047	102,553	1,510,877	227,942	350,693	68,552	621,397	97,676	1,372,480	90.8	138,397	6,299	—117,122	—25,736
	7 mos.	2,309	11,127,868	535,837	12,436,280	1,744,310	2,783,832	438,003	5,150,321	721,505	10,883,916	87.5	1,552,364	586,338	—43,427	785,919
Pittsburg & Shawmut	July	102	64,185	219	65,308	7,056	23,115	1,268	16,587	1,874	49,781	76.2	15,527	14,305	10,133	29,351
	7 mos.	102	421,269	4,375	431,794	66,874	152,340	10,848	116,955	26,539	373,437	86.5	58,357	50,718	46,373	129,826
Pittsburgh & W. Virginia	July	138	156,505	54	170,963	22,156	49,634	13,561	35,044	13,269	140,265	82.0	30,698	16,688	40,454	92,598
	7 mos.	138	1,156,170	679	1,266,123	132,815	397,043	101,661	269,763	100,903	1,051,830	83.1	214,293	56,426	163,762	405,512
Pittsburg, Shawmut & Northern	July	197	48,242	235	50,031	21,242	15,893	1,384	23,571	6,244	68,334	136.6	—18,303	—20,898	—23,875	15,121
	7 mos.	197	536,972	1,905	555,824	125,373	137,781	11,411	218,586	47,295	540,446	97.2	15,378	—2,234	—28,349	122,024
Reading	July	1,461	2,844,804	257,791	3,400,169	232,874	668,346	76,173	1,464,505	192,234	2,653,360	78.0	746,809	665,747	649,779	136,335
	7 mos.	1,460	25,977,000	2,094,794	30,581,609	2,917,007	6,820,336	553,797	12,694,344	1,358,266	24,485,627	80.1	6,095,982	5,306,336	5,102,563	2,896,411
Atlantic City	July	163	55,307	213,083	281,766	9,083	21,503	3,692	148,138	3,474	185,983	66.0	95,783	57,413	47,020	94,356
	7 mos.	163	477,690	521,981	1,074,937	178,098	121,855	20,792	857,685	27,360	1,206,830	112.3	—131,893	—406,939	—441,980	—449,801
Richmond, Fredericksburg & Potomac	July	117	268,255	100,561	437,010	38,459	88,205	8,495	190,763	29,051	362,482	82.9	74,528	46,528	10,751	28,397
	7 mos.	117	2,375,972	1,045,126	4,220,755	382,991	850,120	65,273	1,633,861	221,667	3,258,548	76.7	982,207	744,602	392,711	1,065,225
Rutland	July	413	185,552	39,893	306,299	70,440	58,307	9,885	130,234	13,520	282,386	92.2	23,913	2,341	5,527	18,097
	7 mos.	413	1,415,811	285,194	2,275,130	398,013	450,513	75,329	969,122	100,912	1,979,569	87.0	295,561	143,857	165,217	98,825
St. Louis-San Francisco	July	5,266	2,683,092	280,155	3,231,407	442,974	739,863	98,998	1,156,288	152,760	2,600,083	80.46	631,324	280,837	227,957	932,089
	7 mos.	5,266	19,470,790	1,945,167	23,532,181	3,265,095	5,298,169	703,769	8,380,993	1,174,498	19,119,507	81.25	4,412,674	2,046,490	1,670,947	6,365,371
Ft. Worth & Rio Grande	July	233	37,563	938	45,258	18,879	10,711	2,864	23,472	4,169	60,070	132.7	—14,812	—19,469	—28,186	—21,867
	7 mos.	233	223,917	10,806	276,979	122,026	85,355	19,609	172,882	27,689	427,380	154.3	—150,401	—182,830	—239,160	—206,297
St. Louis, San Francisco & Tex.	July	262	101,157	303	104,408	16,204	15,758	4,830	46,890	6,911	90,593	86.8	13,815	9,208	—18,412	27,614
	7 mos.	262	558,027	3,849	589,673	140,152	127,578	36,522	289,662	52,040	645,919	109.5	—56,246	—87,935	—293,508	—183,624
St. Louis Southwestern Lines	July	1,913	869,583	20,411	934,957	156,067	174,749	80,241	367,355	78,225	863,614	92.4	71,343	—18,894	—192,981	252,067
	7 mos.	1,913	6,820,075	135,631	7,438,693	1,029,498	1,217,137	566,149	2,690,774	640,675	6,199,369	83.3	1,239,324	640,294	—175,586	1,210,180
San Diego & Arizona	July	155	32,136	2,927	35,756	4,929	8,609	2,015	15,949	4,284	36,057	100.9	—307	—3,569	—2,699	10,112
	7 mos.	155	201,476	25,468	240,201	221,144	64,653	15,099	98,081	31,307	432,698	180.1	—192,497	—222,611	—223,476	75,283
Seaboard Air Line	July	4,417	1,454,185	217,958	1,858,317	369,631	520,112	134,203	848,453	119,877	2,015,297	108.4	—156,980	—308,780	—303,517	79,691
	7 mos.	4,446	15,518,849	1,785,343	19,236,547	3,095,186	4,043,227	1,049,594	7,317,783	1,033,487	16,753,606	87.1	2,482,941	919,919	352,277	2,363,505
Southern Ry.	July	6,722	3,884,757	669,569	5,030,091	787,348	1,424,296	149,438	2,128,490	261,995	4,788,957	95.2	241,134	—283,572	—392,807	739,494
	7 mos.	6,723	33,592,968	4,923,895	42,391,834	6,644,699	10,324,425	1,190,895	16,788,256	2,022,984	37,272,438	87.9	5,119,396	1,279,340	242,184	4,699,669
Alabama Great Southern	July	315	209,783	51,981	287,644	43,846	113,952	12,427	118,999	14,789	306,732	106.6	—19,088	—57,458	—53,238	39,715
	7 mos.	315	1,862,538	318,443	2,400,096	472,669	788,013	80,812	956,744	128,164	2,448,803	102.0	—48,707	—317,911	—317,953	197,227
Cinn., New Orleans & Tex. Pac.	July	337	654,236	57,555	760,486	101,014	210,811	24,332	231,449	37,299	609,281	80.1	151,205	91,709	101,128	251,414
	7 mos.	337	5,210,505	479,886	6,107,719	931,858	1,664,409	181,233	1,823,356	316,361	4,953,267	81.1	1,154,452	752,946	799,584	1,159,925

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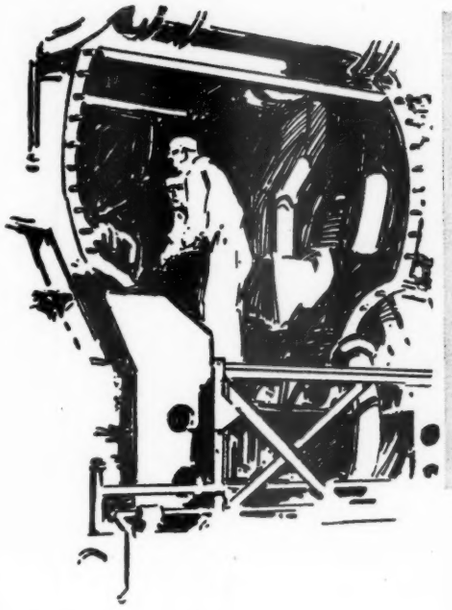

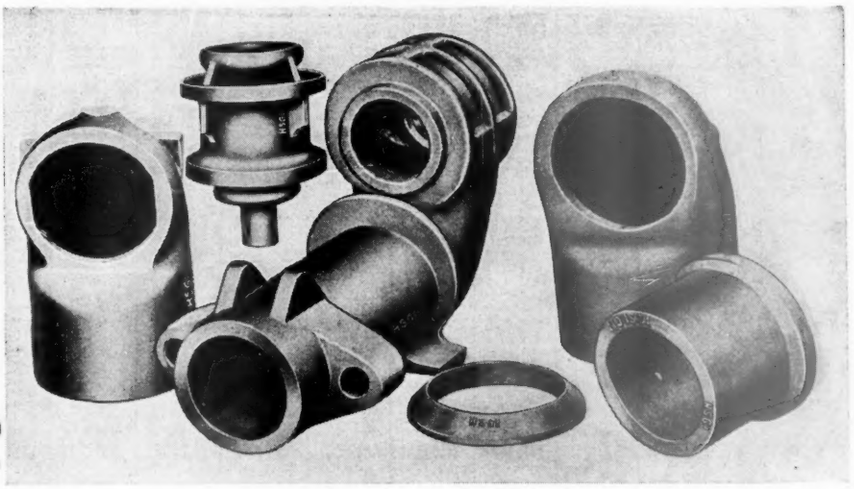

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Revenues and Expenses of Railways

MONTH OF JULY AND SEVEN MONTHS OF CALENDAR YEAR 1932—CONTINUED

Name of road		Av. mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net ry. operating income.	Net ry. operating income, 1931.
Georgia Southern & Florida	July	397	$126,659	$21,390	$161,657	$23,168	$36,451	$1,443	$52,898	$2,185	$118,199	73.1	$43,458	$26,446	$34,153	$25,875
	7 mos.	397	910,731	175,909	1,199,100	239,469	315,075	13,842	425,497	16,305	1,029,593	85.9	169,507	47,427	79,393	149,781
New Orleans & North Eastern	July	204	100,512	28,589	141,799	24,930	43,326	8,041	64,649	9,444	152,254	107.4	—10,455	—41,417	—47,851	—38,156
	7 mos.	204	930,499	167,947	1,198,827	228,054	338,520	48,236	491,984	77,155	1,197,349	99.9	1,478	—215,770	—288,325	—275,810
Northern Alabama	July	99	21,801	931	24,158	6,190	1,263	812	11,357	1,791	21,413	88.6	2,745	—2,348	—13,965	—10,062
	7 mos.	100	248,608	8,400	268,069	79,089	9,998	8,821	102,392	15,860	216,158	80.6	51,911	16,215	—76,656	—50,898
Southern Pacific	July	9,101	6,861,310	1,716,744	9,332,115	914,974	1,523,057	301,067	3,370,803	521,045	6,826,144	73.1	2,505,971	1,530,488	958,891	2,453,301
	7 mos.	9,105	45,870,996	11,615,606	63,563,224	7,109,781	11,621,869	2,071,152	23,709,555	3,895,680	49,765,543	78.3	13,797,681	6,225,336	3,219,516	11,909,494
So. Pacific Steamship Lines	July	....	302,826	35,665	350,265	11,999	92,561	18,441	254,405	37,266	414,672	118.4	—64,407	—65,081	—65,213	—75,039
	7 mos.	....	2,307,808	165,984	2,606,857	107,628	806,738	126,881	2,034,232	203,245	3,278,724	125.8	—671,867	—681,403	—681,727	—611,159
Texas & New Orleans	July	4,602	1,713,036	269,866	2,247,419	416,718	466,552	128,932	920,520	220,358	2,165,310	96.3	82,109	—193,744	—393,018	574,341
	7 mos.	4,620	14,332,121	1,945,111	18,509,511	3,040,141	3,840,998	917,131	7,053,377	1,593,153	16,542,872	89.4	1,966,639	35,955	—1,366,932	1,260,737
Spokane, Portland & Seattle	July	552	324,708	45,587	412,541	49,529	51,896	10,055	153,758	20,051	286,400	69.4	126,141	51,774	33,313	88,635
	7 mos.	554	2,189,946	260,709	2,745,278	339,405	427,230	75,317	1,043,067	150,659	2,042,623	74.4	702,655	162,354	102,405	569,943
Tennessee Central	July	295	104,238	4,286	115,244	20,621	18,191	4,428	43,848	3,713	90,797	78.8	24,447	20,181	10,439	20,252
	7 mos.	295	957,485	31,852	1,046,726	179,234	153,823	45,143	408,188	70,640	855,997	81.8	190,729	160,292	79,323	120,905
Terminal R. R. Assn. of St. Louis	July	55	.....	.....	430,013	54,423	28,655	3,753	221,264	17,096	327,540	76.2	102,473	15,572	82,453	141,053
	7 mos.	55	.....	.....	3,364,938	436,540	223,070	27,549	1,685,185	134,967	2,525,440	75.1	839,498	230,734	707,528	1,033,282
Texas & Pacific	July	1,950	1,380,155	187,089	1,746,700	166,555	311,486	67,268	546,380	103,935	1,211,904	69.4	534,796	423,728	261,842	539,947
	7 mos.	1,950	9,442,433	1,410,831	12,273,988	1,247,331	2,265,238	490,514	4,004,707	768,472	8,892,812	72.5	3,381,176	2,563,445	1,608,903	3,618,365
Texas-Mexican	July	162	36,170	692	44,748	10,185	13,313	3,365	25,727	6,563	59,112	132.1	—14,364	—19,514	—20,563	—9,735
	7 mos.	162	388,442	4,809	434,768	70,384	79,795	22,036	151,257	47,227	370,634	85.2	64,134	27,664	3,473	—62,998
Toledo, Peoria & Western	July	239	124,738	8	126,828	23,071	10,000	12,345	53,419	7,044	105,879	83.5	20,949	17,936	6,952	17,057
	7 mos.	239	777,278	301	791,388	169,155	69,782	87,210	278,385	68,104	672,636	85.0	118,752	98,106	38,831	99,848
Toledo Terminal	July	28	.....	.....	49,616	3,862	9,576	499	23,558	5,008	42,502	85.7	7,114	—4,230	8,289	24,718
	7 mos.	28	.....	.....	451,775	42,851	83,118	3,595	208,127	33,270	370,958	82.1	80,817	684	100,143	200,565
Union R. R. of Penna.	July	45	.....	.....	127,768	51,768	86,421	148	75,581	13,453	227,371	178.0	—99,603	—106,034	—86,760	168,660
	7 mos.	45	.....	.....	1,201,056	326,393	655,990	968	702,509	96,571	1,782,431	148.4	—581,375	631,807	459,747	248,152
Union Pacific	July	3,768	4,556,730	571,915	5,667,846	482,270	987,831	120,932	1,696,858	278,349	3,652,515	64.4	2,015,331	1,489,389	1,174,709	1,121,078
	7 mos.	3,768	28,700,482	3,742,292	36,210,245	2,901,167	7,232,745	950,777	11,788,926	2,113,147	25,548,488	70.4	10,761,757	7,129,365	5,781,901	7,153,859
Oregon Short Line	July	2,506	993,425	119,192	1,257,465	196,043	210,424	38,398	508,290	95,816	1,074,349	85.4	183,116	—74,647	—157,537	—244,128
	7 mos.	2,506	9,054,479	870,651	10,874,328	1,375,780	1,660,962	303,164	3,908,380	749,737	8,201,272	75.4	2,673,056	886,879	332,795	796,665
Oregon-Wash. R. R. & Nav. Co.	July	2,338	724,029	99,896	963,746	144,130	160,678	52,485	451,420	87,909	902,562	93.7	61,184	—83,986	—200,872	34,189
	7 mos.	2,338	5,825,232	707,494	7,493,786	1,154,508	1,158,951	411,068	3,464,999	692,171	6,939,123	92.6	554,663	—534,751	—1,265,665	—767,580
Los Angeles & Salt Lake	July	1,249	934,470	198,796	1,238,740	112,975	177,437	45,661	401,113	63,285	834,969	67.4	403,771	252,572	102,866	58,354
	7 mos.	1,249	7,075,312	1,155,440	9,004,291	902,787	1,303,257	382,295	2,938,908	484,097	6,250,772	69.4	2,753,519	1,716,192	816,645	413,697
St. Joseph & Grand Island	July	258	151,643	3,033	164,695	23,877	22,906	2,347	65,322	13,863	128,315	77.9	36,380	24,503	—3,291	13,050
	7 mos.	258	1,169,480	22,049	1,256,117	165,490	161,967	17,588	442,852	101,316	889,213	70.8	366,904	275,691	152,242	140,217
Utah	July	111	33,460	.....	33,604	11,244	17,719	378	10,543	4,431	44,315	131.9	—10,711	—13,959	—24,862	—21,600
	7 mos.	111	582,403	.....	584,797	87,167	167,246	2,704	140,483	33,762	431,362	73.8	153,435	109,029	22,366	14,106
Virginian	July	608	885,483	6,417	932,841	99,570	180,890	16,532	190,808	28,970	313,257	55.0	419,584	294,584	338,561	517,387
	7 mos.	608	6,900,888	49,110	7,307,956	746,685	1,436,702	113,590	1,515,167	201,318	4,003,571	54.8	3,304,385	2,319,319	2,751,093	3,323,585
Wabash	July	2,523	2,579,386	203,575	3,003,806	477,042	485,146	147,840	1,283,112	139,723	2,543,237	84.7	460,569	249,618	—103,096	94,952
	7 mos.	2,523	19,115,691	1,539,729	22,331,526	3,217,734	3,719,065	1,119,313	9,676,535	1,166,491	18,988,466	85.0	3,343,060	1,871,715	—624,712	1,460,058
Ann Arbor	July	293	215,271	3,135	231,921	42,586	54,846	12,168	107,662	10,533	228,036	98.3	3,885	—11,432	—28,721	—17,942
	7 mos.	293	1,778,122	23,599	1,863,719	257,580	374,890	95,075	829,076	82,407	1,639,428	88.0	224,291	96,100	—34,761	61,030
Western Maryland	July	892	706,303	14,306	763,190	64,398	135,325	37,591	218,296	37,763	488,168	64.0	275,022	210,022	187,604	384,806
	7 mos.	891	6,564,555	56,041	7,034,939	928,140	1,294,698	282,617	1,921,559	283,706	4,673,308	66.4	2,361,631	1,876,631	1,812,279	2,521,692
Western Pacific	July	1,163	823,440	48,584	954,788	149,838	156,623	57,210	345,995	33,726	795,375	83.3	159,413	75,626	28,720	50,881
	7 mos.	1,083	4,946,882	255,701	5,597,048	837,557	1,201,794	423,481	2,547,911	268,793	5,454,027	97.4	143,021	—489,046	—517,433	—511,735
Wheeling & Lake Erie	July	511	608,441	2,511	648,303	61,673	174,264	28,097	207,647	29,622	501,303	77.3	147,000	68,437	34,213	180,741
	7 mos	511	4,270,005	24,859	4,540,651	576,587	1,258,031	214,756	1,583,964	203,626	3,836,900	84.5	703,751	125,635	—22,665	743,881
Wichita Falls & Southern	July	203	44,015	48	46,941	10,301	7,401	2,365	12,866	3,737	36,670	78.12	10,271	6,103	2,530	22,489
	7 mos.	203	317,065	365	330,758	69,560	53,602	12,960	92,003	23,720	251,845	76.14	78,913	49,726	24,899	19,589